eleventh edition

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The Nature and Sources of Ecological Progress in the U.S. and the World

by Steven F. Hayward

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Finally, to the many donors who make all of our work possible, our endless gratitude.

—*Steven F. Hayward*

PREFACE

After a decade, the *Index of Leading Environmental Indicators* is by degrees changing its character and approach to the subject of offering an annual checkup on environmental trends in the U.S. and reviewing the major environmental issues from the previous year. As has been observed in previous editions, when this project began in the pre-Internet age of the early 1990s, there were few efforts to compile environmental trend data and organize indicators of ecological conditions. In those days, acquiring the data meant trudging slowly through dusty reports in government documents, usually at an Environmental Protection Agency (EPA) library. Today, of course, there is a surfeit of data on the Internet, and a welcome proliferation of public and private efforts to develop environmental indicators. Previous editions have highlighted the growth of these similar and often superior efforts at developing environmental indicator sets.

The embarrassment of riches now available to environmental researchers makes it more rather than less difficult to produce this annual report in a brief and useable form. It's tempting to expand the size and scope of this report to be more comprehensive. At some point, however, such an effort crosses the line into a data dump, in which the primary focus gets lost. In addition, the volume of data has brought into sharper focus how inadequate and incomplete much of these data are. Hence the philosophy of this report: less is more.

The chief focuses are areas of environmental progress and their causes. The default position of the media and environmental advocacy groups is always to highlight the many problems we face. According to Gallup's annual environmental poll, conducted in March 2005, 63 percent of Americans think environmental quality is getting worse in the U.S., though 54 percent also tell Gallup they are optimistic about our environmental future. Where conditions are improving, and moreover *why* and *how* they are improving, receive much less attention. The comparison between areas of improvement and areas where we fall short should be instructive to policymakers in setting priorities and making reforms to address the truly stubborn problems.

The significant gaps in our knowledge of many areas of concern are surprising and alarming for a nation that devotes hundreds of billions of dollars a year to environmental protection. In no other area of public policy do we have such inconsistent and haphazard means of assessing outcomes. For education, we have the Bureau of Education Statistics; for crime, we have the Bureau of Justice Statistics; for the economy and employment, we have the Bureau of Labor Statistics. But we have no Bureau of Environmental Statistics, though there have been calls for just such a government body since the first Earth Day in 1970. The contentiousness of environmental issues along with the fragmentation of authority for environmental policy in the federal government (why is the Forest Service still in the Department of Agriculture?) has stymied efforts to organize a coherent reporting scheme.

The U.S. measures some environmental conditions very well, such as air quality, chiefly because air quality is relatively easy to monitor consistently. Fortunately, air pollution trends are a superb proxy for general environmental progress, because air pollution is linked so closely to energy use and technological innovation. Complete data for 2005 were not yet ready from the EPA as this report went to press, so our air-quality section this year examines some subtrends that illuminate how we have succeeded in reducing air pollution so dramatically.

This look at the subtrends in air quality marks the beginning of the transition of this report from merely reporting large-scale environmental conditions in the U.S. to probing more deeply to understand the causes of improvement—or the failure to make improvement. In addition, this edition expands its focus beyond American shores. The last two editions have included comparisons between trends in the U.S. and the European Union. Increasingly detailed data are becoming available for the developing world, so it is now possible to begin surveying environmental trends on a global scale.

This issue contains a special section examining what was perhaps the most prominent environmental story of 2005—China. Amidst much of the typical hand-wringing about China's formidable problems, this report notes unacknowledged signs of improvement. The position this report once staked out on the fringe—that economic growth and markets are the prerequisites to environmental improvement—is now the conventional wisdom. China, India, and other emerging nations are the test cases in the 21st century for the axiom that has become known as the "Environmental Kuznets Curve," according to which economic growth precedes environmental improvement.

Hence, this edition includes a new subtitle to mark its evolving direction: *The Index of Leading Environmental Indicators: The Nature and Sources of Ecological Progress in the U.S. and the World.*

—Steven F. Hayward

INTRODUCTION: *The Year the Music Stopped?*

The year 2005 offered a full plate of environmental episodes that riveted the nation's attention, including sky-high energy prices, expanded talk of permanent oil shortages, Hurricane Katrina, and the United Nations Climate Change Conference in Montreal, where the U.S. came in for the usual pasting from the "international community." Yet a funny thing happened along the way.

The modern environmental movement died.

Perhaps this is an overstatement. No movement that commands hundreds of millions of dollars in financial resources and millions of dues-paying members can be said to be fully deceased. The end of the year saw environmentalists celebrating a large political victory in Washington, D.C., where efforts to open the Alaska National Wildlife Refuge (ANWR) to oil and gas production were stymied again—though it should be noted that this was purely a defensive win for the greens, relying on a Senate filibuster against majority support for opening ANWR. In the long run that is likely to be a losing hand.

Although the continued success in blocking the opening of ANWR shows the latent potency of environmentalism as a political force in Washington, at the same time the environmental movement increasingly resembles the hapless incipient corpse in *Monty Python and the Holy Grail* who protests, "I'm not dead yet!" Leaders of the environmental movement have been convulsed for much of the last year in an intramural debate over "The Death of Environmentalism," the provocative memorandum from two young insurgents in the movement who argue that environmentalism has failed in its larger aims and should now integrate itself within a broader spectrum of "progressive" causes. "The Death of Environmentalism" received an extraordinary amount of media attention, including front-page news stories in the *New York Times* and the *Washington Post*, and extensive features in publications as diverse as *The Economist* and *The Wilson Quarterly*. The authors, Michael Schellenberger and Ted Nordhaus, are coming out with a book on the subject soon.

Should the environmental movement follow their advice to turn further to the left, we will undoubtedly come to speak of environmentalism's suicide rather than its death from natural causes. To be sure, much of what ails the environmental movement comes from its self-inflicted wounds, but it is still surprising to find environmentalism in its current funk amidst a presidency whose soggy approval ratings are seldom worse than on environmental issues, and at a time when corporate America seems to be embracing green values on a large scale (such as GE's "Ecomagination" campaign). Yet one of the remarkable things about 2005 was that environmentalists received proportionally almost as much bad press as President George W. Bush.

The most striking example of this was *New York Times* columnist Nicholas Kristof, who ordinarily takes conventional environmental views (he is opposed to oil drilling in ANWR, for example), but who wrote in a scathing column in March that "the movement is in deep trouble." More:

> The fundamental problem, as I see it, is that environmental groups are too often alarmists. They have an awful track record, so they've lost credibility with the public. . . . I was once an environmental groupie, and I still share the movement's broad aims, but I'm now skeptical of the movement's "I Have a Nightmare" speeches. . . .

> [E]nvironmental alarms have been screeching for so long that, like car alarms, they are now just an irritating background noise. . . . [I]t's critical to have a credible, nuanced, highly respected environmental movement. And right now, I'm afraid we don't have one.[1]

Kristof was not an isolated example. *Orlando Sentinel* columnist Peter Brown wrote in September: "The environmental movement needs to re-examine some core beliefs before the public-opinion train that forced welfare reform down advocates' throats runs them over, too."[2] *Washington Post* columnist Sebastian Mallaby, in a caustic column entitled "Look Who's Ignoring Science Now," wrote: "environmentalists' credibility in calling for necessary regulation would be enhanced if they were willing to denounce unnecessary regulation."[3] Slate.com wrote of environmentalism's "mid-life identity crisis," and wondered whether "its troops [can] avoid committing movement suicide."[4] In the aftermath of Hurricane Katrina, which environmentalists tried to exploit to promote the issue of climate change, Slate.com returned to the subject, warning that "[e]xploiting bad news and facile pseudoscience to seek support and fresh donations is a good way to lose credibility."[5] British novelist Ian McEwan wrote in the *Los Angeles Times* on Earth Day, April 22, 2005:

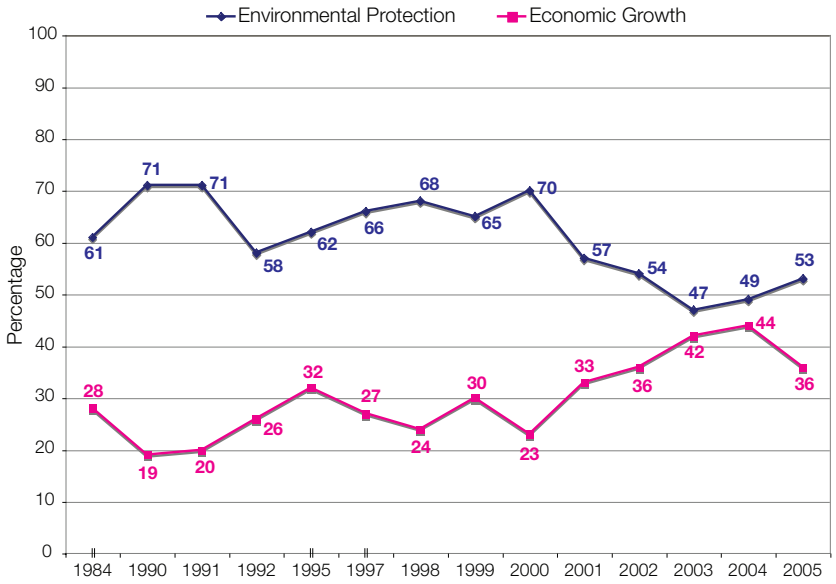
> The environmental movement has been let down by dire predictions—"scientifically based"—that over the last two or three decades have proved spectacularly wrong. . . . Well-meaning intellectual movements, from communism to post-structuralism, have a poor history of absorbing data inconvenient to their fundamental precepts. We should not ignore or suppress good indicators on the environment—and there are quite a few—simply because they do not make the advocate's case. It is tempting to embrace with enthusiasm the latest bleak scenario because it fits our mood. But we should be asking for the provenance of the data, the assumptions fed into the computer model, the response of the peer review community, and so on. Pessimism is intellectually delicious, even thrilling, but the matter before us is too serious for mere self-pleasuring. It would be self-defeating if the environmental movement degenerated into a religion of gloomy faith.[6]

The modern environmental movement has never received this kind of critical attention and commentary in the mainstream media. It is a clear sign that the environmental movement has lost much of its once-unassailable moral authority.

RECENT TRENDS IN PUBLIC OPINION

Previous editions of this report noted significant changes in public opinion polling results on environmental questions, including a narrowing of the historic margin between people who say environmental protection or economic growth should have the higher priority. Gallup's annual environmental poll, released on Earth Day 2005, shows a slight uptick in the proportion of respondents who said that environmental protection should take precedence over economic growth, but the figure is still below the consistent long-term historical trend in the 1980s and 1990s (see Figure 1).

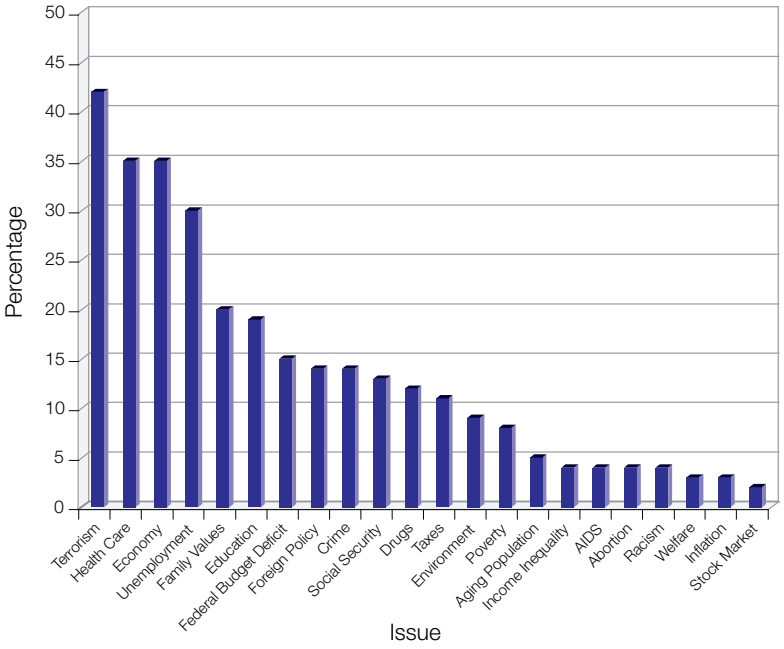
FIGURE 1. Gallup Poll: Should environmental protection or economic growth have priority?



The internals of the Gallup environmental poll, however, tend to buttress the view that the orthodox environmental movement has lost its hold on the American public. Gallup's environmental fellow Riley Dunlap wrote: "Gallup's annual environmental poll finds few signs that environmentalists opposed to President George W. Bush's environmental agenda have had success persuading the public to see things from their perspective." Amazingly, Gallup reported that George W. Bush gets slightly higher average approval ratings on environmental issues (49 versus 47 percent) than his father received, even though former President George H. W. Bush backed the Clean Air Act of 1990, attended the 1992 Earth Summit in Rio, and committed the U.S. to the United Nation's (UN) framework convention on climate change.[7] The Gallup poll found that "a majority of Americans perceive that the Bush administration has either kept environmental protection the same *or strengthened it*." (Emphasis added.) Although the current President Bush's approval ratings for his handling of the environment have fallen (though mostly in direct proportion to his general approval ratings as they have declined), "such perceptions do not appear to be leading to a dramatic upsurge in support for environmentalism," said Gallup's Dunlap.

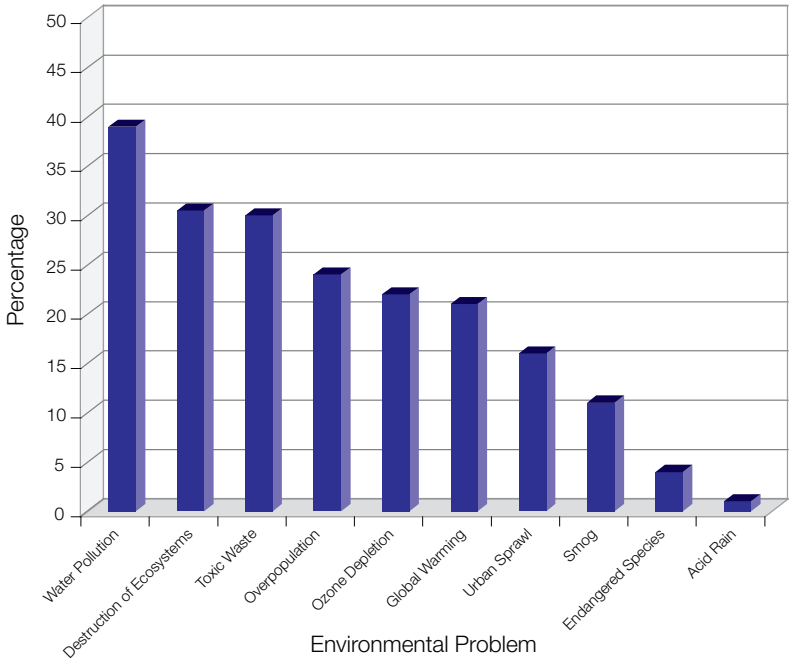
A separate survey by the Massachusetts Institute of Technology (MIT) published last winter found that respondents placed environmental issues 13th out of 21 issues ranked by importance. Less than 10 percent of respondents ranked the environment as one of the top three most important issues, below crime, Social Security, drugs, and taxes (terrorism was unsurprisingly ranked as the most important issue facing the U.S.). More surprisingly, respondents of the MIT survey ranked global warming sixth out of 10 environmental issues, below water pollution and toxic waste. The Gallup Poll also found global warming ranks far down the list of public environmental concerns (see Figures 2-4; the difference between the percentages in Figures 3 and 4 can be attributed to the open-ended nature of the MIT question versus the Gallup survey, which prompted the respondent with a fixed list of issues). The MIT survey also found very low public awareness of key aspects of climate change, and respondents indicated limited willingness to pay higher energy costs to reduce greenhouse gas emissions.[8]

FIGURE 2. Curry MIT Poll: Which is the most important problem facing the U.S. today? (Percentage of respondents including an issue in their top two are shown.)



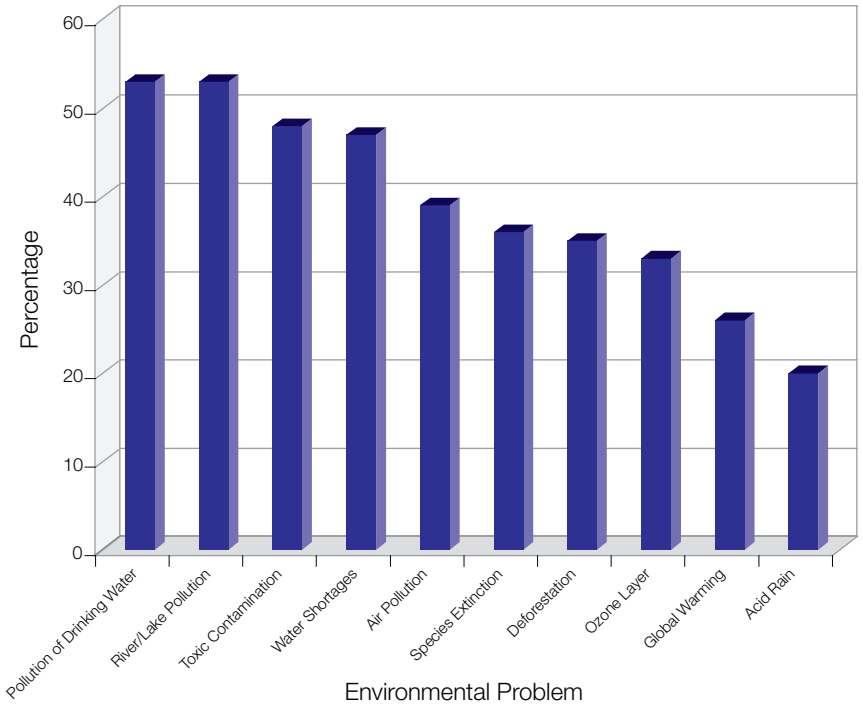
(Source: Tom Curry, et al, MIT, 2005)

FIGURE 3. Curry MIT Poll: Which is the most important environmental problem facing the U.S. today? (Percentage of respondents including an issue in their top two are shown)



(Source: Tom Curry, et al, MIT, 2005)

FIGURE 4. Gallup Poll: Which of the following environmental problems do you worry "a great deal" about?



(Source: Gallup Poll, Earth Day, 2005)

Some general polls offer an important clue as to why environmentalists are increasingly marginalized from public opinion: Americans, by large majorities, are overwhelmingly optimistic—*even if a catastrophe looms*. Such was the surprising finding of a survey McLaughlin and Associates conducted last spring.[9] One interesting aspect of the survey was that younger Americans—the cohort typically thought most sympathetic to environmental causes—were more optimistic than older Americans. While 82 percent of 18- to 44-year-olds said they were optimistic about the future, only 64 percent of respondents over age 65 said they were optimistic. "What amazed us most was their determined optimism, even as they showed great concern about bad things happening in the world," said Dr. Donald Louria of the Department of Preventive Medicine and Community Health at the New Jersey Medical School in Newark, which commissioned the survey.

What made the findings so surprising was that up to three-quarters of respondents said they expect the U.S. to suffer a biological or nuclear attack at some point in the next 20 years. Yet only a third considered global warming to be a significant threat. "We found this relative lack of concern surprising, given the overwhelming scientific consensus that global warming is occurring now, and that if unchecked, could be disastrous," said Dr. Cheryl Kennedy, a psychiatrist at the New Jersey Medical School.

TIME FOR SECOND THOUGHTS?

Paul W. Hansen

Green in Gridlock

While President Bush and many of today's Republican leaders seem to be out of step with the American public and much of their own party when it comes to environmental conservation, the tactics of some environmentalists also play a significant role in creating the political polarization and stalemate that have caused gridlock for more than a decade on environmental policy.

The environment is not a "liberal" cause; it is everyone's cause. An overwhelming percentage of Americans care deeply about conservation of natural resources and the environment. This includes strong majorities across all major demographic categories: ethnic, religious, racial, age, gender and political party affiliation.

There are a variety of theories on the causes of the gridlock on such a popular issue: corporate shortsightedness, the influence of money on the legislative process, the alleged interest of Democrats in having the environment as a per-

In 1990, the last time the Clean Air Act was reauthorized, it was a compromise. Acid rain emissions were reduced by 40 percent, but not by the 60 percent that scientists told us was needed. Toxic mercury emissions were not controlled at all. It wasn't a perfect bill, but it reduced air pollution. Clearly, we are better off than we would be if it had not passed. But would such a compromise be acceptable if it were being considered today?

Before the 1990s, the leaders of national conservation groups took the political support and public opinion available to them and, in most cases, made the best deal possible. The nation passed some important, though imperfect, legislation.

In the early '90s, this dynamic changed. When Republican leaders attempted to roll back long-standing protections, national environmental leaders came under intense criticism

There are some hopeful signs of introspection and second thoughts among environmentalists. A number of environmentalists have recognized and lamented that much of the movement has become too politicized, partisan, and uncompromising. Chip Giller, founder of the popular green website Grist.com, wrote in the *Boston Globe:* "What ought to be the biggest of big tents has become, well, a yurt."[10] Paul Hansen, executive director of the Izaak Walton League, wrote in the *Washington Post:* "[W]hen it comes to environmental conservation, the tactics of some environmentalists also play a significant role in creating the political polarization and stalemate that have caused gridlock for more than a decade on environmental policy. . . . [W]e have, by letting the perfect be the enemy of the good, chosen in effect to accomplish nothing." Moreover, Hansen also noted "a lack of civility in the rhetoric and tactics used by some groups. . . . When communications about the environment are too extreme, too dire, or too partisan, large segments of the public tune out and dismiss the message."[11] Mark Van Putten, the former president of the National Wildlife Federation, wrote in *Bioscience:*

> While environmentalists may have the science right, and devote inordinate attention to crafting proposed policies, they have the politics wrong, and are reaping the consequences of having had them wrong for a long time. Although it's convenient to blame the anti-environment bent of the Bush administration and hostile congressional leadership, environmental groups have significantly contributed to their own marginalization. . .
>
> Unfortunately, environmental issues have been framed and claimed in polarizing ways that have largely excluded conservation and environmental stewardship from the central tenets of conservatism. . . . Many Americans who care about the environment do not embrace big government and "command-and-control" regulatory approaches as preferred strategies. . . . Too little attention has been paid to developing an open-ended, values-based dialogue with conservatives that does not presuppose specific policy outcomes.[12]

Even Denis Hayes, one of the prime movers behind the first Earth Day in 1970, recognizes that "To the *double* misfortune of environmentalists, the environment has become a partisan issue."[13] Hayes and the other environmental leaders who are ruing excessive partisanship are on to something important and basic. Policy progress occurs when the two parties *compete* for the middle ground of an issue, as Republicans and Democrats do on health care and education. Congress can pass a No Child Left Behind Act, but cannot, under current conditions, enact a No Species Left Behind Act. Hayes offers that "Sen. John McCain of Arizona, my favorite maverick, has taken courageous leadership roles on major environmental issues." Should McCain come to be the Republican presidential nominee in 2008, what are his chances of being endorsed by any major environmental group such as the League of Conservation Voters? If past history is any guide, close to nil. As previously mentioned, former President George H. W. Bush actively supported a number of environmental

priorities during his presidency. For this he received zero endorsements from environmental groups in his 1992 re-election campaign.

Another environmental group that has gotten the message is The Nature Conservancy (TNC), which commissioned an opinion survey and focus group research in 2004 that reported, among other findings: "DO NOT needlessly politicize an issue which has broad appeal across the political spectrum. Talking about federal government cutbacks tended to politicize the issue [of land conservation] immediately in the focus groups, and the survey confirms that it is a turnoff to GOP voters." Moreover, the TNC report suggested that its conservation-minded members and advocates not refer to themselves as "environmentalists" at all: "In focus groups, there was a decided skepticism about the agenda of some 'environmental groups' who engage in land preservation."

A COMEBACK FOR NUKES?

Although some environmental leaders are having second thoughts about the movement's political partisanship, there are also starting to be second thoughts about some specific issues that were once considered unalterable sacred cows. The most significant of these second thoughts concerns nuclear power. The chief reason for the new look at nuclear power is its non-emission of greenhouse gases. "OLD FOES SOFTEN TO NEW REACTORS," Felicity Barringer reported in the *New York Times* in May 15, 2005.

Environmentalists worried primarily about climate change and greenhouse gas emissions are starting to recognize that the risks of nuclear power are lower than the risks of fossil-fuel power. Stewart Brand, founder of the popular *Whole Earth Catalogue*, wrote in the May issue of *Technology Review:*

> The only technology ready to fill the gap and stop the carbon dioxide loading of the atmosphere is nuclear power. Nuclear certainly has problems—accidents, waste storage, high construction costs, and the possible use of its fuel in weapons. It also has advantages besides the overwhelming one of being atmospherically clean. The industry is mature, with a half-century of experience and ever improved engineering behind it. Problematic early reactors like the ones at Three Mile Island and Chernobyl can be supplanted by new, smaller-scale, meltdown-proof reactors like the ones that use the pebble-bed design. Nuclear power plants are very high yield, with low-cost fuel. Finally, they offer the best avenue to a "hydrogen economy," combining high energy and high heat in one place for optimal hydrogen generation.[14]

Brand admitted that being pro-nukes was "environmental heresy," but predicted that within a decade, the mainstream of the environmental movement would change its mind and embrace nuclear power.

But Brand was not alone. The aforementioned Nicholas Kristof also endorsed nuclear power in his *New York Times* column: "[I]t's time. . . to drop that hostility to nuclear power. It's increasingly clear that the biggest environmental threat we face is actually global warming, and that leads to a corollary: nuclear energy is green."[15] Kristof quoted British scientist James Lovelock, the originator of the popular "Gaia hypothesis" that the entire Earth should be regarded as a single self-regulating

organism: "I am a Green, and I entreat my friends in the movement to drop their wrongheaded objection to nuclear energy. . . . Only nuclear power can halt global warming."[16]

Former Anglican Bishop Hugh Montefiore, a long-time trustee of Friends of the Earth, wrote that "I have now come to the conclusion that the solution [to global warming] is to make more use of nuclear energy."[17] (Friends of the Earth were not friendly to his heresy, and demanded Montefiore's resignation from its board.) Sir David King, Prime Minster Tony Blair's chief science adviser and leading advocate for strong action to combat climate change, added his voice to the pro-nuclear chorus in October. King said nuclear power has "the safest record of all the power industries in the world."[18] (Prime Minister Tony Blair intends to launch 10 new nuclear power plants over the next few years, according to *The Independent*.[19]) A *Forbes* magazine cover headline succinctly put the point: "Nukes Are Back; Where Are the Protesters?"[20]

The Economist reported in July that climate change worry "has led some greens to take the view that a nuclear revival is better than doing nothing much about climate change. Leaders of respected environmental outfits such as Environmental Defense and the World Resources Institute have recently made positive noises about nuclear power as part of a response to global warming."[21] The *Times*' Felicity Barringer reported, "In recent statements, three top environmental experts—Fred Krupp, the executive director of Environmental Defense, and Jonathan Lash, the president of the World Resources Institute, and James Gustave Speth, the dean of Yale's School of Forestry and Environmental Studies—have stopped well short of embracing nuclear power, but they have emphasized that it is worth trying to find solutions to the economic, safety and security, waste storage, and proliferation issues rather than rejecting the whole technology."[22]

Amanda Griscom of the green website Grist.org reported in *Wired* magazine a softening of opposition among environmental groups such as the Natural Resources Defense Council and even within the Union of Concerned Scientists ("[I]nsiders say the Union of Concerned Scientists has a growing pro-nuke faction").[23] Elsewhere on Grist.org, John Elkington and Mark Lee of the British-based nongovernmental organization (NGO) SustainAbility asked: "Is the environmental movement in danger of letting its allergic response to nuclear power blind it to a scenario filled with new technologies and players?"[24] Greenpeace and the Sierra Club, meanwhile, remained unalterably opposed.

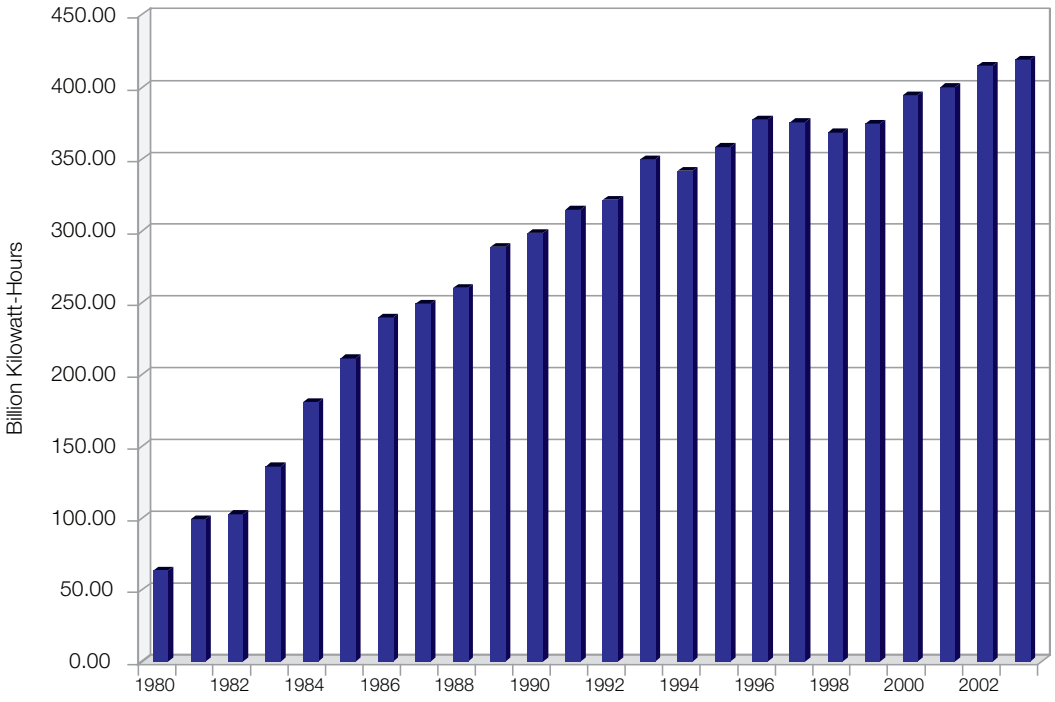
One problem with nuclear power is that in the past its cost structure made it uncompetitive without large government subsidies. The next generation of nuclear technology may be overcoming this defect. Peter Schwartz and Spencer Reiss reported in a feature on nuclear power in *Wired* magazine that new reactor technology may now be cheaper to build than coal-fired and gas-fired plants, and that improvements in existing reactor technology have reduced nuclear operating costs to 1.82 cents per kilowatt-hour versus 2.13 cents for coal-fired plants and 3.69 cents for natural gas.[25] Nonetheless, Congress is taking no chances; the energy bill that recently passed Congress includes several billion dollars in potential subsidies for any new nukes that might be built. A more interesting scenario would be to consider what the economics of nuclear power would look like with either a carbon tax and/or a carbon emissions–trading scheme in place, both of which might well level the economic playing field for nuclear power. (Think of it as an inverse subsidy.) If

natural gas prices remain high—natural gas being the favored alternative to coal at the moment—the economics of nuclear power might begin to look more attractive without subsidies.[26]

The U.S. currently generates about 20 percent of its electricity from nuclear power. France, meanwhile, generates more than 70 percent of its electricity from nuclear power. In the past 25 years, France expanded its nuclear electricity generation more than six-fold, and plans to expand its nuclear capacity further (see Figure 5). Not surprisingly, France has one of the lowest rates of greenhouse gas emissions per capita or per dollar of gross domestic product (GDP) of any industrialized nation—about two-thirds lower than that of the U.S. (see Figures 6 and 7). Belgium derives 58 percent of its electricity from nukes; Sweden, 45 percent; South Korea, 40 percent; Switzerland, 37 percent; Japan, 31 percent; Spain, 27 percent; and the U.K., 23 percent. Europe's nuclear industry succeeds in generating electricity at a lower cost than standard fossil-fuel technologies such as coal, gas, and oil.

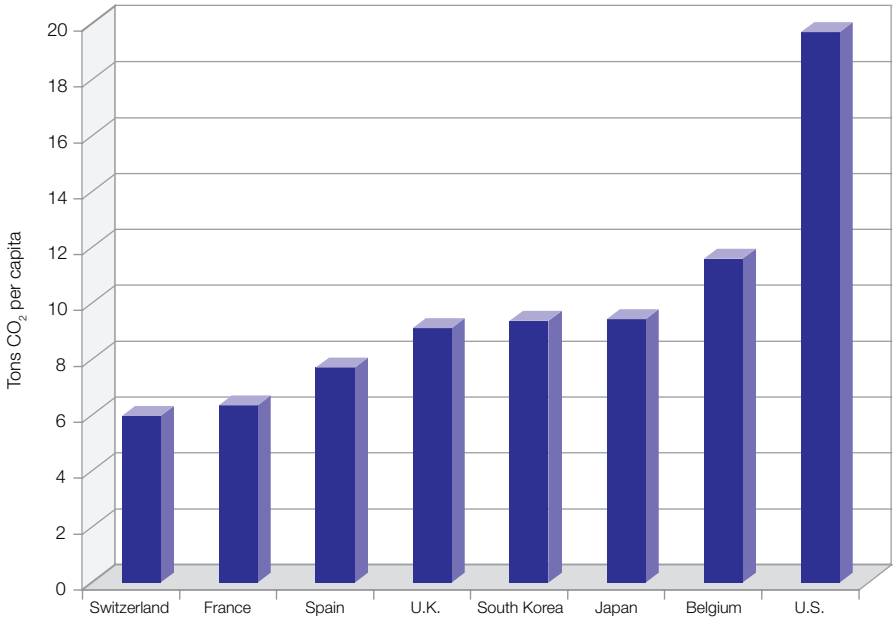
According to figures reported in *The Economist*, Germany can generate nuclear electricity for 1.5 cents per kilowatt-hour, compared with 3.1-3.8 cents to produce power from natural gas and 3.8-4.4 cents to produce it from coal. One reason for this comparative advantage is that European nations, especially France, use a standardized power-plant design, rather than the custom, one-off designs typical in the U.S. that are vastly more expensive. "We standardized nuclear plants like Ford did the Model T,"[27] said one French nuclear engineer. France's standardized design results in 20 percent lower operating costs and 30-40 percent lower capital costs than the custom designs built in the U.S. and U.K.

FIGURE 5. Nuclear-Generated Electricity in France



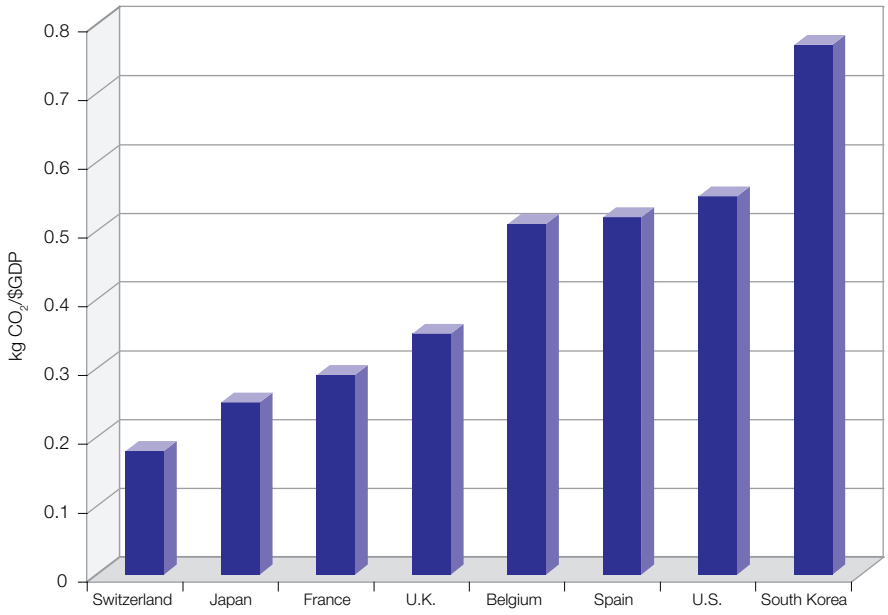
(Source: Energy Information Administration)

FIGURE 6. Tons CO_2 per Capita (2003)



(Source: International Energy Agency)

FIGURE 7. CO_2 Emissions (kg) per Dollar of GDP (2003)



(Source: International Energy Agency)

Meanwhile, the old case against nuclear power on safety grounds was dealt a blow in 2005 with the reports of fresh research on the aftermath of the worst nuclear accident in history—the 1986 Chernobyl disaster in the former Soviet Union. In September the UN released a 600-page report, comprising the work of more than 100 scientists, economists, and public health experts, which concluded

the health effects of the Chernobyl accident had been vastly overestimated.[28] In the immediate aftermath of Chernobyl, there were estimates that the death toll could ultimately reach into the hundreds of thousands. The UN study found that only 50 deaths could be attributed to immediate radiation exposure (mostly rescue workers who rushed into the facility), and concluded that the long-term death toll would be about 4,000. This number should be contrasted with the estimated 15,000 deaths *per year* in the U.S. attributed to emissions from coal-fired power plants, or the more than 5,000 Chinese miners who die each year in Chinese coal mines.

MEDIA COMMENTARY ON GREEN NUKES

"The central hypocrisy of the green movement in our era is that anti-nuclear policy has driven the U.S. to use the hydrocarbon fuels so much opposed by the anti-global warming movement."[47]

Amity Shlaes
Financial Times

"The more seriously you take the idea of global warming, the more seriously you have to take nuclear power. Clean coal, solar-powered roof tiles, wind farms in North Dakota—they're all pie in the emissions-free sky. Sure, give them a shot. But zero-carbon reactors are here and now. We know we can build them. Their price tag is no mystery. They fit into the existing electric grid without a hitch. Flannel-shirted environmentalists who fight these realities run the risk of ending up with as much soot on their hands as the slickest coal-mining CEO."[48]

Peter Schwartz and Spencer Reiss
Wired

Contrary to predictions that cancer rates in the region would soar, the UN study found that the incidence of radiation-induced cancer rose by only about 3 percent. Moreover, the survival rate for people who contracted thyroid cancer is 99 percent, far higher than previous estimates. "The effects on public health were not nearly as substantial as had at first been feared," said Michael Repacholi, head of the radiation program at the World Health Organization. Poverty and mental-health problems including depression are greater health problems than the fallout from Chernobyl, the report concluded.[29]

THE RETURN OF DDT

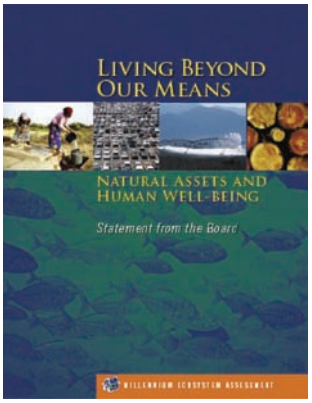
Another specific area where the environmental edifice is cracking is the revived use of DDT to control malaria in the developing world. Greenpeace and the World Wildlife Fund (WWF) both told the *New York Times* last spring that DDT use may be necessary to prevent the spread of malaria in affected countries. This marks a break in the near-solid front of environmentalist opposition to DDT use anywhere. "South Africa was right to use DDT," WWF spokesperson Richard Liroff told Nicholas Kristof.[30] "If the alternatives to DDT aren't working, as they weren't in South Africa, geez, you've got to use it. In South Africa it prevented tens of thousands of malaria cases and saved a lot of lives." Greenpeace's Rick Hind said, "If there's nothing else and it's going to save lives, we're all for it. Nobody's dogmatic about it."[31] (Additional discussion of DDT and wildlife can be found in the chapter on Biodiversity later in this report.)

Meanwhile, the acute local effects of DDT can still be found on display in southern California, where *Los Angeles Times* environmental reporter Marla Cone noted in a story published in May that

efforts to revive bald eagles on Santa Catalina Island were being stymied by large residues of DDT still present in the Pacific Ocean off Palos Verdes Peninsula.[32] Industrial companies that routinely dumped DDT and other chemicals into the Los Angeles sewer system for years in the mid-20th century have paid $140 million in remediation costs—the second-largest resource-remediation settlement of its kind after the *Exxon Valdez* case. Nearly $40 million of the settlement has been spent trying to re-establish bald eagles and other raptors in the area, but the DDT residues, which will eventually break down and dissipate, are continuing to weaken eagle eggshells to the point that the reintroduced population is not yet self-sustaining. Keeping the program going will require millions of dollars after the settlement money runs out.

Cone's story doesn't raise the impertinent question of why, with bald eagle populations nationally recovering to the point that they will be taken off the Endangered Species List, extreme and costly efforts of being made to reintroduce eagles in a region that remains inhospitable to their well-being at the moment. Just as wolves were beginning to migrate back to the Rocky Mountains before the intensive reintroduction effort began in the 1990s, bald eagles will likely make their way back to California's Channel Islands in the fullness of time. It is an interesting case study in the patchwork, litigation-driven character of many environmental remediation efforts.

THE MILLENNIUM ECOSYSTEM ASSESSMENT



An important event of 2005 that made one-day headlines and then disappeared from view was the rollout of several large reports from the UN's Millennium Ecosystem Assessment (MEA), a five-year project to do exactly what the name implies—assess ecosystem conditions on a global scale.[33] The MEA is an immense undertaking, involving the efforts of more than 1,300 scientists around the world. The first series of reports are more than 3,000 pages long. Like the Intergovernmental Panel on Climate Change (IPCC), the MEA has to grapple with the difficulty of addressing a global issue with myriad dimensions.

The MEA identifies 24 "ecosystem services" that it sets out to evaluate on a global and regional scale. Fifteen of the 24 show worsening trends; four show improvement; and the remaining five show no change.[34] A closer look at the local detail provided in the MEA's subglobal assessments (which were just being published as this report went to press) might confirm important lessons about the relationship of wealth to environmental progress. For example, although the MEA finds only four improving trends and 15 deteriorating trends for the globe as a whole, if these indicators were examined just for the U.S., it would probably report 17 improving trends, seven with no change, and none with deteriorating trends.

To paraphrase Winston Churchill, by their sheer length the MEA reports defend themselves against the risk of being read. (The full MEA study comprises 14 volumes so far.) And on the surface the MEA appears susceptible to the criticism that it is merely the latest iteration of the

worn-out Malthusian perspective full of doom and gloom about our ecological future. The preface contains some familiar themes, such as the "stark warning" about the future of the planet because "human activity is putting such strain on the natural functions of Earth that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted."[35] Other gifts to editorial writers who work in the subjunctive mood include the statement that the planet has "much more red than black on the balance sheet," and "it is literally a matter of living on borrowed time." And what global environmental report would be complete without the adding that things look bad "unless human attitudes and actions change." This phrase and its equivalents should be a macro keystroke in environmentalists' word-processing programs, if they aren't already.[36]

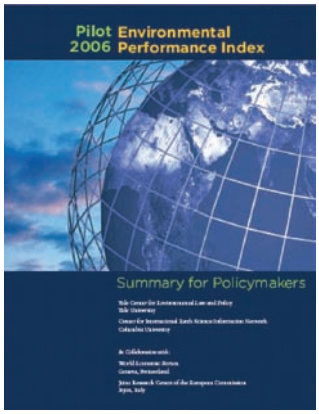
A closer reading calls to mind another famous quip, this time from Mark Twain: "Wagner's music is better than it sounds." There are some notable differences between the MEA and, for example, the *Limits to Growth* report of 1972 or the *Global 2000* report from 1980. As is the fashion with comprehensive reports of this kind, the MEA offers several scenarios of possible future paths that may or may not alleviate the ecological stresses the report discerns. Like all scenario exercises that attempt to anticipate the unpredictable and dynamic future, the MEA's scenarios can be subjected to all manner of criticisms. On the other hand, the important dimension of human resiliency and adaptive capability is central to the MEA's four scenarios: "Global Orchestration," "Order from Strength," "Adapting Mosaic," and "Techno Garden."

The MEA's analysis is not static, which was the downfall of previous synoptic reports about our eco-future. There is an encouraging emphasis on "reforms that focus on global trade and economic liberalization [that] are used to reshape economies and governance. There is an emphasis on the creation of markets that allow equitable participation and provide equitable access to goods and services. These policies, in combination with large investments in global public health and the improvement of education worldwide, generally succeed in promoting economic expansion and lifting many people out of poverty into an expanding global middle class."

Of course the devil is in the details, but as a general matter this is not your grandfather's limits-to-growth environmentalism. The tic-like reflex of the old doomsaying themes of conventional environmental thinking distorted much of the media coverage of the release of the MEA, which tended to portray it as a linear successor to the *Limits to Growth Report*. Finally, the still-to-come regional subassessments of ecosystem conditions may be useful in setting priorities in developing nations where environmental stresses are the worst.

THE *PILOT 2006 ENVIRONMENTAL PERFORMANCE INDEX*

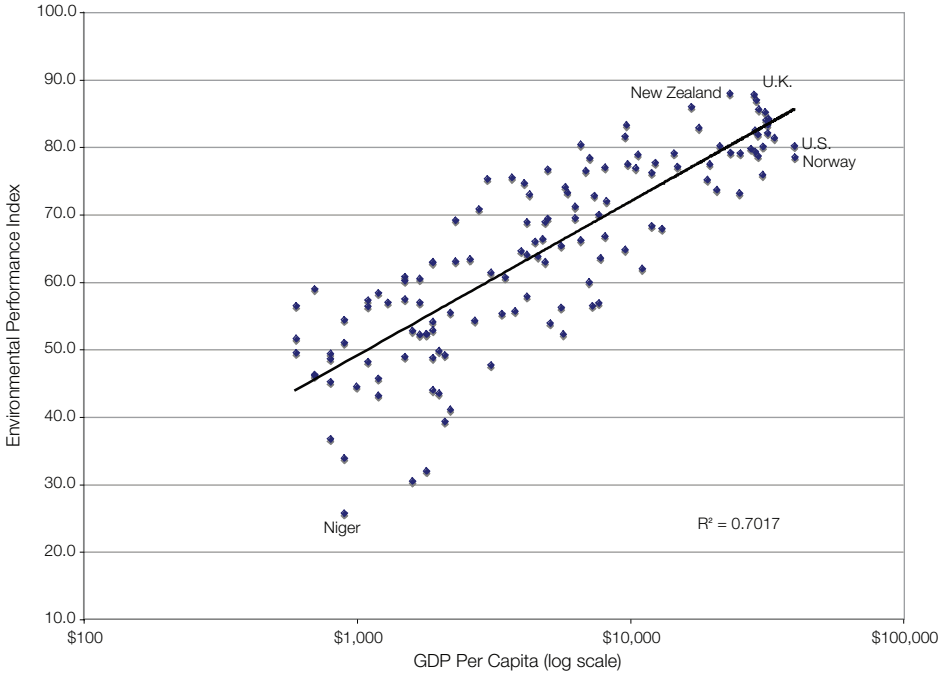
A potentially more useable attempt to evaluate global environmental progress comes in the form of the *Pilot 2006 Environmental Performance Index* (EPI), produced by the Yale Center for Environmental Law and Policy and the Center for International Earth Science Information Network (CIESIN) at Columbia University.[37] The EPI is the successor to the *Environmental Sustainability Index* that the Yale/CIESIN consortium has been producing for the World Economic Forum for several years, and contains a number of refinements of the previous methodology.



In contrast to the MEA or the various "ecological footprint" models that attempt to aggregate global environmental conditions,[38] the EPI attempts to provide objective metrics of environmental performance on a country-by-country basis. As the authors describe it: "The EPI focuses on current on-the-ground outcomes across a core set of environmental issues tracked through 16 indicators in six policy categories for which all governments are being held accountable." Under this framework, New Zealand received the top mark on the EPI rankings, with a composite score of 88.0. The U.S. was ranked 28th with a score of 78.5, just ahead of Cyprus and just behind the Netherlands. (The EPI ranks 133 countries in all.)

Perhaps the most significant finding of this revised methodology by the Yale/CIESIN team is the more robust correlation between wealth and environmental performance, which is displayed graphically in Figure 8 below. The curve showing the relationship between the EPI score and per capita income is much steeper than the curve generated by the same comparison under the previous Yale/CIESIN *Environmental Sustainability Index*.

FIGURE 8. Relationship of 2006 EPI and GDP Per Capita



(Source: Pilot 2006 EPI)

THE HEINZ CENTER'S *THE STATE OF THE NATION'S ECOSYSTEMS* UPDATE AND THE EPA'S ENVIRONMENTAL INDICATORS INITIATIVE

The Heinz Center for Science, Economics, and the Environment, which in 2003 produced the most ambitious private effort at environmental assessment in the U.S., *The State of the Nation's Ecosystems* (reviewed in the 8th edition [2003] of this report), produced another of its periodical updates late in 2005, offering updates for 12 indicators (out of more than 120 previously selected). One of the most significant findings of the original Heinz Center report was the lack of adequate data to draw conclusions about nearly half of the ecosystem indicators the process identified. The Heinz Center is committed to refining and updating its project on a regular basis.[39]

Finally, the EPA's laborious effort to develop a consistent set of environmental indicators should not be overlooked. The EPA's most recent effort at a synoptic environmental report, the 2003 *Draft Report on the Environment*, fell prey to interagency squabbling and fierce outside criticism that it flunked climate change.[40] But the EPA has persevered with its Environmental Indicators Initiative, and is aiming for a second throw at the report in 2007. The EPA currently has about 100 indicators selected for use in its report, but has several categories still out for selection and refinement. Several draft chapters of useful information are available at the EPA's website.[41]

However, there are still significant gaps and inadequacies in the data-gathering programs of the federal government, as the Government Accountability Office (GAO) noted in a report to Congress released in September 2005.[42] The GAO reviewed 20 major data-gathering programs and concluded that 15 of the 20 are producing adequate data to support ecological indicator projects (especially the Heinz Center's ongoing report), but that five data programs were of doubtful quality. One of the greatest shortcomings in data gathering is in water quality and quantity, which is hampering efforts to evaluate the effectiveness of water pollution control measures.

MISCELLANY

Several irresistible environmental stories from the year past deserve mention:

- In Cambridge, Massachusetts, a Harvard professor who teaches environmental economics was arrested for stealing 100 cubic yards of. . . manure. As the *Harvard Crimson* wryly reported, "Monrad Professor of Economics Martin L. Weitzman was involved in a market failure of his own." No word about what the good professor was doing with the manure, though it was speculated that he was selling it (100 cubic yards would fetch about $600 at current prices). Apparently he didn't produce enough of the stuff in his own classroom. One of his neighbors told the *Crimson:* "These damn economists. Always makes you wonder about the moral foundation of that profession."[43]

- Greenpeace, that activist and sometimes militant guardian of the environment, received an $11,000 fine from the Philippines after it crashed its ship *Rainbow Warrior II* into a coral reef in August. The ship rammed a 160-square-meter section of the Tubbataha Reef, located in a protected marine park in the Sula Sea, 375 miles south of Manila. Ironically, Greenpeace was in the area to study the effects of global warming on coral reefs, but at Tubbataha found only healthy coral and no evidence of bleaching. The science of coral reef bleaching, a Greenpeace spokesman said, is "extremely complicated." Indeed. Meanwhile, up in Alaska, Greenpeace faced criminal charges for not filing required oil spill contingency reports with state regulators before sailing the Greenpeace ship into state waters as a part of a protest against logging. Sauce for the goose. . . . [44]

- Reports of "exploding toads" made headlines in Germany and Denmark last year, where more than 1,000 corpses of bloated and mutilated toads were found around several ponds. After searching for some kind of environmental catastrophe at work, biologists concluded that the toads fell victim to predators, most likely birds, that, in the words of one biologist, "simply made a very messy job of eating their favorite parts of the toads, such as the liver." [45]

- Elsewhere in Germany, Bavarian barmaids were protesting a European Union directive to cover up to protect themselves from "natural sources of radiation," meaning sunlight. This threatens to eliminate the centuries-old barmaid attire known as the "dirndl," which is described as "a dress and apron with a tight, low-cut top whose figure-hugging effect is enhanced by a short white blouse." "This is European lawmaking at its most pedantic," said Munich's mayor, Christian Ude. "A waitress is no longer allowed to wander round a beer garden with a plunging neckline. I would not want to enter a beer garden under these conditions."[46]

NOTES

[1] Nicholas D. Kristof, "I Have a Nightmare," *New York Times*, March 12, 2005.
[2] Peter Brown, "Get Real Environmentalists," *Orlando Sentinel*, September 30, 2005.
[3] Sebastian Mallaby, "Look Who's Ignoring Science Now," *Washington Post*, October 10, 2005.
[4] Paul Sabin, "The Environmental Movement's Midlife Identity Crisis," http://slate.msn.com/id/2117147/.
[5] Paul Recer, "The Katrina Science Test," September 12, 2005, http://www.slate.com/id/2125908/.
[6] Ian McEwan, "The Hot Breath of Civilization," *Los Angeles Times*, April 22, 2005.
[7] And both Bushes, at 49 and 47 percent, respectively, are way ahead of Ronald Reagan, who was broadly more popular than either Bush throughout his presidency, but whose average environmental approval rating in the Gallup Poll was 36 percent.
[8] Brian Stempeck, "Poll Finds Public Awareness Sorely Lacking," *Greenwire*, March 24, 2005; http://www.wapa.gov/es/greennews/2005/mar2805.htm; Tom Curry et al., "How Aware is the Public of Carbon Capture and Storage?" Massachusetts Institute of Technology, http://uregina.ca/ghgt7/PDF/papers/peer/137.pdf.
[9] Jennifer Harper, "American optimism stuns pollsters," *Washington Times*, May 19, 2005.
[10] Chip Giller, "The Environment's New Bling," *Boston Globe*, April 21, 2005.
[11] Paul W. Hansen, "Green in Gridlock," *Washington Post*, March 15, 2005.
[12] Mark Van Putten, "Rebuilding a Mainstream Consensus for Environmentalism," *BioScience*, Vol. 55, No. 6 (2005), pp. 468–469.
[13] http://www.motherearthnews.com/features/2005_April_May/Celebrate_Earth_Day/.
[14] Stewart Brand, "Environmental Heresies," *Technology Review*, May 2005.
[15] Nicholas D. Kristof, "Nukes Are Green," *New York Times*, April 9, 2005.
[16] Ibid.
[17] Peter Schwartz and Spencer Reiss, "Nuclear Now! How Clean, Green Atomic Energy Can Stop Global Warming," *Wired*, January 2005. The article provoked a vocal backlash from *Wired* readers. In the April 2005 issue of *Wired*, the editors wrote: "In February, we suggested it's time to reconsider nuclear power; readers had a meltdown. Even onetime environmentalist-in-chief Al Gore chimed in at Davos, complaining directly to our editor in chief."
[18] David Adam, "Chief Scientist Backs Nuclear Power," *The Guardian*, October 21, 2005.
[19] Michael Harrison, "Blair Set to Press Nuclear Button," *The Independent*, February 15, 2005.
[20] *Forbes* Magazine, February 7, 2005.
[21] *The Economist*, December 10-16, 2005.
[22] Felicity Barringer, "Old Foes Soften to New Reactors," *New York Times*, May 15, 2005.
[23] This is a sidebar to Schwartz and Reiss, *Wired*, January 2005.
[24] http://www.grist.org/biz/fd/2005/12/13/nuclear/index.html.
[25] Peter Schwartz and Spencer Reiss, op cit.
[26] *The Economist* offers a useful overview of these aspects of the issue in "Nuclear Power: The Shape of Things to Come?", July 7, 2005.
[27] Ibid.
[28] Valeska Stephan, "Chernobyl: poverty and stress pose 'bigger threat' than radiation," September 7, 2005, *Nature.com* (http:// news.nature.com//news/2005/050905/437181b.html).
[29] Ibid.
[30] Nicholas D. Kristof, "It's Time to Spray DDT," *New York Times*, January 8, 2005.
[31] Ibid.
[32] Marla Cone, "DDT May Outlast Eagles," *Los Angeles Times*, May 22, 2005.
[33] http://www.millenniumassessment.org/en/index.aspx. The announcement of the MEA was discussed in the 7th edition (2000) of the *Index of Leading Environmental Indicators*.
[34] The 24 ecosystem services are: food, fiber, genetic resources, biochemicals, water, air quality regulation, climate regulation, water regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, natural hazard regulation, spiritual and religious values, aesthetic values, and recreation/ecotourism.
[35] The four main findings are summarized as follows:

"Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on earth.

"The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem

services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.

"The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals.

"The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA has considered but these involve significant changes in policies, institutions and practices that are not currently under way. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative tradeoffs or that provide positive synergies with other ecosystem services."

[36] An example of the long pedigree of this kind of environmental unctuousness can be found in Fairfield Osborn's 1949 book *Our Plundered Planet,* in which Osborn warned that environmental disaster loomed unless there was a "complete revolution in man's point of view toward the earth's resources and toward the methods he employs in drawing upon them."

[37] http://www.yale.edu/epi/.

[38] See http://www.footprintnetwork.org/index.php.

[39] http://www.heinzctr.org/ecosystems/report.html.

[40] See the discussion of this report in the 9th edition (2004) of this report, available at: http://www.pacificresearch.org/pub/sab/enviro/04_enviroindex/index.html, pp. 17-18.

[41] http://www.epa.gov/indicators/index.htm.

[42] *Environmental Information: Status of Federal Data Programs that Support Ecological Indicators,* U.S. Government Accountability Office, #GAO-05-376, September 2005; available at: www.gao.gov/new.items/d05376.pdf.

[43] Robin M. Peguero, "Economics Professor Causes a Stink," Harvard Crimson, April 15, 2005.

[44] "Greenpeace to be fined as Rainbow Warrior damages Philippines coral reef," Agence France Presse, October 31, 2005. Government Accountability Office, #GAO-05-376, September 2005; available at: www.gao.gov/new.items/d05376.pdf.

[45] Michael Hopkin, "Has bubble burst over exploding toad tale?", www.nature.com/news/2005/050425/full/050425-13.html.

[46] Kate Connolly, "Barmaids protest as EU plans cover-up in the beer gardens," *Daily Telegraph,* March 8, 2005.

[47] Amity Shlaes, "Exorcising America's Many Nuclear Demons, " *Financial Times,* April 26, 2005.

[48] Schwartz and Reiss, op cit.

According to the official climate scorekeepers, 2005 was the warmest year on record. The only thing that seems to get hotter at a faster rate than the temperature is the argument over the issue—a phenomenon that hasn't yet been plotted in a computer model. The deepening controversy over climate change policy is a sure sign that the matter is not settling into a rough consensus, as is typically the case with large-scale public policy problems. Although no one is openly saying so, the end of 2005 leaves the matter very nearly at a "back-to-the-drawing-board" stage.

Most of the controversy surrounding the issue of climate change centers on the schism between the camps of so-called "alarmists" and "skeptics" who argue bitterly over whether the science is "settled" or whether "uncertainties" cast doubt on our mastery of climate phenomena. In 2005, political and economic realities overshadowed the scientific disputes. The big climate policy news of 2005 ought to have been that the first big step in climate action—the Kyoto Protocol—finally went formally into force in February, following the belated ratification of Russia. The heart of emissions-reductions strategy in Europe was going to be carbon trading, which, it was expected, would produce a low and stable price for the early steps in carbon abatement. It didn't turn out that way.

Volatile energy prices on the world market contributed to a wildly gyrating market, with the price of a metric ton of carbon starting the year around €8.50, but soaring up to €29 per ton in July, then down to €18 and up again to €22 in August. This kind of volatility is great for traders, but not for electricity producers and consumers. (Germany had to hike electric rates by about 15 percent.) Most of the 15 core nations of the European Union are on course to fall well short of their Kyoto targets, and by the end of the year, the Kyoto framework appeared to have reached a dead end. The Council of the Parties meeting in Montreal in December 2005 seemed as forlorn as a gathering of the World Esperanto Association.

The most significant turning point came in September, when British Prime Minister Tony Blair, who heretofore had made climate change and near-term greenhouse gas emissions reductions a high priority, shocked his own environmental constituency with a series of comments in which he backed away from a Kyoto-style strategy of near-term carbon suppression. At President Bill Clinton's "Global Initiative" conference in New York on September 15, Blair said: "I would say probably I'm changing my thinking about this in the past two or three years. I think if we are going to get action on this, we have got to start from the brutal honesty about the politics of how we deal with it. The truth is no country is going to cut its growth or consumption substantially in the light of a long-term environmental problem." Blair went on to add that "to be honest, I don't think people are going, at least in the short term, going to start negotiating another major treaty like Kyoto."[1]

This was not a one-off comment from Blair, but evidently reflected his serious reconsideration of the state of play, as Blair's follow-up comments made clear. "It's easy to take frustrations out on the Bush Administration," Blair wrote in *The Observer* in October, "but people forget that the Senate voted 95-0 against Kyoto when Bill Clinton was in the White House. We have to understand as well that, even if the U.S. did sign up to Kyoto, it wouldn't affect the huge growth in energy consumption we will see in India and China."[2] Although not abandoning the idea of a Kyoto successor treaty with "targets and timetables," Blair shifted his emphasis to accelerating technological development and technology transfer to the developing world.

Blair was soon seconded by his science adviser Sir David King, who had previously charged that climate change was a larger world threat than terrorism; he said, "I don't think any country is going to manage a process where the suspicion is that they will need to reduce their GDP growth."[3] And Blair's Environment Minister, Margaret Beckett, followed up on Blair's new tack with comments to the effect that developed countries that insist on binding global emissions targets would be considered "the new imperialists" by developing nations: "People would never engage in dialogue if they thought the outcome was preconceived and could hamper their development. . . . Such an approach would be utterly destructive to any kind of agreement."[4] Beckett suggested voluntary targets, "informal mechanisms," and industry-specific emissions programs would be a more suitable way to go forward after Kyoto's initial commitment period expires in 2012.

Because Blair has one of the keenest political noses for future trends and possibilities, his perspectives are worth giving considerable weight. Environmentalists in Britain were furious. The executive director of Friends of the Earth said Blair's comments were "extremely retrograde and dangerous. . . . It's seismic in climate change politics and threatens 15 years' worth of negotiations."[5] Greenpeace dumped a ton of coal at 10 Downing Street. A spokesman for the World Wildlife Fund delivered the lowest insult available in British politics: "The actual negotiating position of the Prime Minister becomes daily less discernible from that of U.S. President George W. Bush."[6]

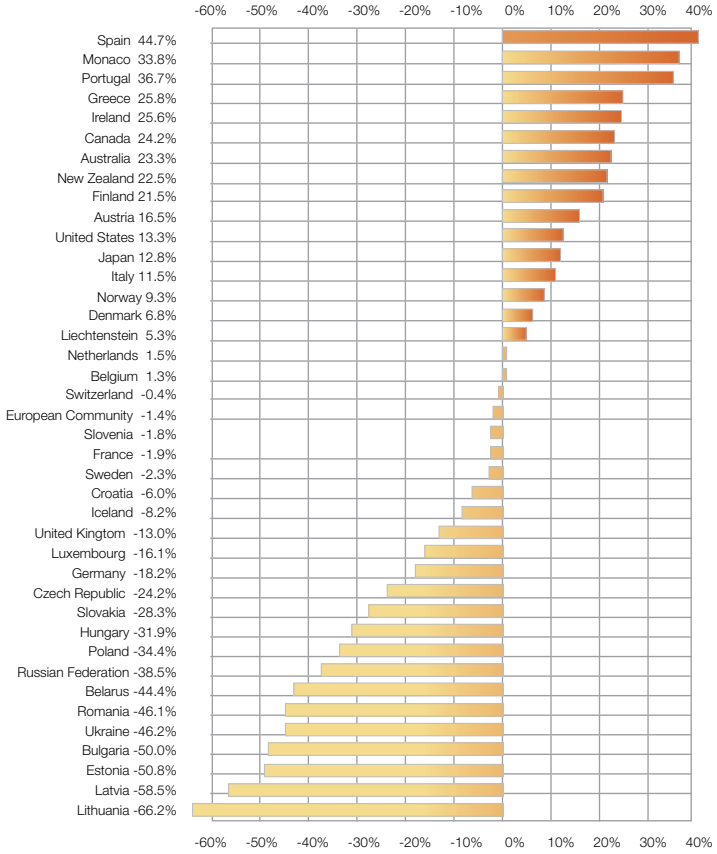
Despite some subsequent backing and filling—Blair said later that "targets" are necessary—his British critics are correct in discerning that Blair is moving closer to the Bush Administration's approach to climate change, which emphasizes economic growth in the developing world and long-term energy research breakthroughs as a more realistic path to a post-carbon future. This became evident at the Group of Eight (G-8) summit in July at Gleneagles, Scotland, which Blair hosted and had promised would focus in part on climate change. Many observers expected that President Bush would come under renewed pressure to relent in his opposition to binding emissions caps like Kyoto. However, the statement issued at the G-8 summit appeared to be a vindication of Bush's perspective. One portion of the G-8 communiqué adopted the exact language the Bush Administration has been using in the U.S. since 2001: "While uncertainties remain in our understanding of climate science, we know enough to act now to put ourselves on a path to slow and, as the science justifies, stop and then reverse the growth of greenhouse gases." The communiqué's policy guidance placed greater emphasis than previous statements on economic growth, technological innovation, and—above all—*adaptation* to climate change. "U.S. APPEARS TO WIN GLOBAL WARMING DEBATE" was the dismayed Associated Press (AP) headline from Gleneagles: "Leaders of the world's wealthy nations appeared to bow to U.S. pressure on climate change, issuing a watered-down declaration Friday that avoids setting targets or timetables for reducing greenhouse gas emissions."[7]

On the surface, Blair's tilt on the issue was a surprise given that Britain was one of the few European nations thought to be on course to meet its Kyoto emissions reduction target, in large part because of Britain's move away from coal to natural gas back in the Thatcher era. Under Kyoto, Britain committed to reducing 1990 greenhouse gas emissions by 12 percent by the years 2008-2012. Britain's forward progress was such that when Blair took office in 1997, he announced that Britain would try to exceed their Kyoto target and achieve a 20-percent reduction. According to the most

recent UN figures, Britain had indeed achieved a 13-percent reduction by 2003 (see Figure 1; some U.K. environmental groups dispute these figures).

However, in the most recent two years, it appears this progress has halted and gone into reverse gear. In the first six months of 2005, the British government announced that greenhouse gas emissions had risen 2.5 percent. Most European nations were committed under Kyoto to reduce emissions by 8 percent below 1990 levels; Figure 1 below shows how all the Annex I nations are doing so far. It should be noted that except for Britain, the nations showing large reductions in greenhouse gas emissions, such as Lithuania or Poland, did so through economic contraction and the shuttering of grossly inefficient industries after the collapse of the Soviet empire in the early 1990s (the European Environment Agency euphemistically called this "economic restructuring"). This would include Germany, most of whose emissions reductions came from shuttering old facilities in the former East Germany. This large reduction is looking increasingly like a one-time affair rather than a long-term trend: greenhouse gas emissions are now rising in most of the former Eastern bloc nations.

FIGURE 1. Total Aggregate Greenhouse Gas Emissions of Individual Annex I Parties, 1990-2003*



Percentage Change Relative to 1990

* The change related to 1990 shown here is for 2002 except for Liechtenstein (1990), Poland (2001), and Russian Federation (1999)

(Source: United Nations Framework Convention on Climate Change)

An additional wrinkle to Blair's about-face on climate policy was a stinging report issued in July from the British House of Lords' Select Committee on Economic Affairs. "The Economics of Climate Change," the Lords' report, endorsed unanimously by the 13 members of the committee from all political parties, argued that both the IPCC and British government policy had an inadequate grasp of fundamental economic aspects of climate-change issues, including especially the emissions-forecasting component of the climate modeling process, and the potential cost of significant carbon emission abatement.[8] (*Nature* magazine acknowledged the substance of this critique in a pair of articles in January of this year. "[T]here is a growing feeling," *Nature*'s climate science correspondent Quirin Schiermeier wrote, "that the economic assumptions on which [the IPCC's] work is based are outdated and unreliable."[9])

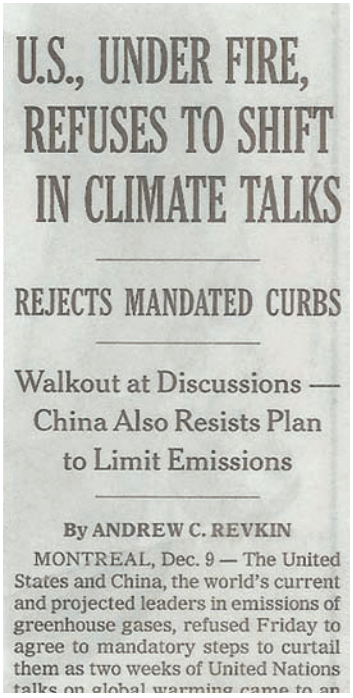
The Lords' report also cast doubt on the objectivity of the IPCC process, and recommended greater involvement of the government's Treasury department (and, by implication, finance ministries in other nations). Lord Nigel Lawson (former Chancellor of the Exchequer under Prime Minister Margaret Thatcher) was the most outspoken member of the committee, telling the press: "I believe that the IPCC process is so flawed, and the institution, it has to be said, so closed to reason, that it would be far better to thank it for the work it has done, close it down, and transfer all future international collaboration on the issue of climate change, where the economic dimension is clearly of the first importance, to the established Bretton Woods institutions."

Two weeks after the release of the Lords' report the U.K. Treasury department announced it would launch a review of the economics of climate-change policy, though not with the same focus as called for in the Lords' report. Named the "Stern Review" after its appointed chairman, Sir Nicholas Stern, the official Treasury effort will concentrate chiefly on the costs and benefits of greenhouse gas policies.[10] The Stern Review is expected to report its results in the fall of 2006.

The year's *sturm und drang* came to a climax at the 11th annual Council of the Parties conference in Montreal in December, where the U.S. came in for the usual pasting for its refusal to join the Kyoto bandwagon. The most farcical moment came when Paul Martin, the Prime Minister of Canada (where greenhouse gas emissions are up 24.2 percent since 1990), lambasted President Bush and the U.S. (where greenhouse gas emissions are up 13.3 percent since 1990—half as much as Canada) as the chief obstacle to reducing global greenhouse gas emissions. Canada, as the largest foreign supplier of oil and gas to the U.S. (not Saudi Arabia, as typically assumed) could cut greenhouse gas emissions through the simple expedient of halting oil and gas sales to the U.S., but don't hold your breath. Former President Bill Clinton seemed to agree with Martin in widely quoted remarks criticizing the Bush Administration for abandoning Kyoto, but less noticed was Clinton's recommendation that "given the impasse over global targets for emissions, countries might do better to consider specific, smaller initiatives to advance and disseminate technologies that could greatly reduce emissions in both rich and poor countries. . . . If you can't agree on a target, agree on a set of projects so everyone has something to do when they get up in the morning."[11] This more or less expresses the Bush Administration's general strategy.

Martin's hypocritical blast, along with similar theatrics at Montreal, signaled the dead-end of the Kyoto approach for the near term at least. *New York Times* science writer Andrew Revkin

summarized the state of play at Montreal: "[Kyoto] was the first agreement of its kind. But it may also prove to be the last. Today, in the middle of new global warming talks in Montreal, there is a sense that the whole idea of global agreements to cut greenhouse gases won't work. . . . But the current stalemate is not just because of the inadequacies of the protocol. It is also a response to the world's ballooning energy appetite, which, largely because of economic growth in China, has exceeded almost everyone's expectations. And there are still no viable alternatives to fossil fuels, the main source of greenhouse gases. Then, too, there is a growing recognition of the economic costs incurred by signing on to the Kyoto Protocol."[12]



U.S., UNDER FIRE, REFUSES TO SHIFT IN CLIMATE TALKS

REJECTS MANDATED CURBS

Walkout at Discussions — China Also Resists Plan to Limit Emissions

By ANDREW C. REVKIN

MONTREAL, Dec. 9 — The United States and China, the world's current and projected leaders in emissions of greenhouse gases, refused Friday to agree to mandatory steps to curtail them as two weeks of United Nations talks on global warming came to an

The Economist, which has previously described the Kyoto protocol as "incompetently designed," noted that the Montreal meeting had been "a rather cheerless affair," but suggested that "through the gloom there are some encouraging developments." One of these is the Asia-Pacific Partnership (APP), the parallel process the U.S. established with five other nations of the Asia-Pacific region (China, India, Japan, Australia, and South Korea), which together account for about half of the world's total greenhouse gas emissions. As the new year began, the APP held its first meeting in Sydney, Australia, and began to articulate an alternative strategy to the Kyoto approach. Its communiqué emphasized as its first priority economic development and the eradication of poverty as the key prerequisite to coping with climate change. It also struck notes of realism about energy, observing that "fossil fuels underpin our economies, and will be an enduring reality for our lifetimes and beyond."[13] The partnership members pledged more resources for advanced energy research, but also for work on making current fossil-fuel energy cleaner. The real game afoot behind the APP is probably to accelerate advanced technology transfer to India and China, whose greenhouse gas emissions are expected to soar in the coming years.

While the APP is a more promising approach than Kyoto, a caveat should be registered. Government-sponsored energy research has a mixed record (whatever happened to all those "Synfuels" we were promised in the 1970s?), so it is worth noting one of the more interesting speculations on this subject to appear in 2005, a discussion paper from Resources for the Future (RFF) suggesting that the government might get better results if it offered large prizes for specific energy and climate-related breakthroughs rather than old-fashioned research grants.[14] The paper's authors, economists Richard Newell of RFF and Nathan Wilson of the Energy Information Administration, note the successful use of such prizes back to the 18th century, such as the British government offering a prize for advances in ocean navigation, and various public and private sector prizes for breakthroughs in automobile and airplane technology here and abroad in the 20th century. The most prominent such prize recently was the Ansari X-Prize for private space travel. The idea of a government-funded prize is not as outlandish as it may sound.

A little-known EPA initiative in the 1980s offered a prize for a breakthrough in super-efficient refrigerator technology, and the National Aeronautics and Space Administration (NASA) offers a series of prizes for specific innovations. Newell and Wilson observe: "In contrast with the basic, mainstream research that grants induce, anecdotal evidence implies that prizes attract the attention of less hidebound thinkers who are willing to challenge technological orthodoxies. By attracting such practitioners to established research avenues such as carbon sequestration or renewable fuels, inducement prizes could trigger an advance in GHG [greenhouse gas]-reducing technologies that research-subsidizing levers might not have produced. A prize established in more avant-garde areas could be used to encourage conventional research groups to pursue less conventional research directions."

CLIMATE RESEARCH HIGHLIGHTS

Though we persistently hear that the consensus on climate change has settled the matter beyond a reasonable doubt, there continues to be curious anomalies reported in the scientific literature. A few highlights from 2005 include:

- David Douglass and Robert Knox, physicists at the University of Rochester, published a study in the May edition of *Geophysical Research Letters* examining detailed temperature data for the decade following the 1991 eruption of Mount Pinatubo in the Philippines (the largest volcanic eruption of the 20th century). They found that the recorded temperature changes do not match up well with climate-model predictions. Douglass and Knox found that world temperatures, initially lowered by about one-half a degree Fahrenheit in the aftermath of Pinatubo, rebounded close to normal within a year, while climate models predicted a return to equilibrium temperatures would take several years or more. Douglas and Knox wonder whether climate models overestimate the effect of aerosols in the atmosphere and therefore also overestimate the effect of CO_2.[15]

- A team of paleoclimatologists led by Jan Esper surveyed a range of studies about "reconstructed temperature amplitude" (in plain English, our efforts to estimate temperature ranges several centuries ago), and found that while there is general agreement on past climate change episodes, there is "substantial divergence" in the range of estimated temperatures. A greater amplitude "would result in a redistribution of weight towards the role on natural factors in forcing temperature changes, thereby relatively devaluing the impact on anthropogenic emissions and affecting future predicted scenarios. If that turns out to be the case, agreements such as the Kyoto protocol that intend to reduce emissions of anthropogenic greenhouse gases, would be less effective than thought." (Published in *Quaternary Science Reviews*.[16])

- What's going on with Arctic and Antarctic ice sheets? It is easy to get whipsawed by the competing reports of ice thinning or breaking off the Ross Ice Shelf while ice in west Antarctica is *thickening*. A re-

CLIMATE MISCELLANY

Other notable climate-related stories of 2005 included the revelation from orbital images of Mars that the Red Planet is apparently undergoing climate change of its own without benefit of sport-utility vehicle (SUV) emissions. NASA's Mars Global Surveyor, in orbit around Mars for nine years now, discovered significant shrinkage of ice caps on Mars, which ironically consist mostly of frozen carbon dioxide.

Two Russian physicists, Galina Mashnich and Vladimir Bashkirtsev, have made a $10,000 bet with British climate expert James Annan that global temperatures will decline in the next decade. Mashnich and Bashkirtsev are among the scientists who believe the short-term epicycles of solar radiation (sunspots) has more to do with the last decade's temperature rise than greenhouse gases. To decide who wins the bet, the scientists have agreed to compare the average global surface temperatures recorded by a U.S. climate center between 1998 and 2003 with temperatures they will record between 2012 and 2017. Stay tuned: we'll try to report the results in the 24th edition of the *Index of Leading Environmental Indicators* come 2018.

port last fall from NASA concluded that Arctic sea ice was at its lowest extent since monitoring began in 1978, though the NASA report was not able to state the thickness of Arctic ice. This aspect of the issue was reported on by Antarctic researcher Duncan Wingham of University College London at the Earth Observation Summit in Brussels in February of last year. According to Wingham, measurements from two European satellites showed the Antarctic ice sheet was thickening. This might not be inconsistent with global warming, however, according to some climate models, warmer temperatures will or are leading to increased snowfall in parts of Antarctica. But Wingham thinks, "To claim that the ice sheets are melting is rather daring."

Meanwhile, a new effort to get at the bottom of Arctic ice trends took flight with the October launching of CryoSat, the most sophisticated satellite yet deployed for arctic imaging. Containing twin radar antennae that will provide CryoSat with three-dimensional capabilities, the satellite will be able to detect changes in ice thickness as small as a few centimeters, even through cloud cover. Climate researchers from Columbia University and NASA's Goddard Institute published findings from satellite data that show soot from sources in Asia is having a discernable effect on Arctic warming. Soot particles darken the surface of arctic ice slightly, causing it to absorb more solar energy rather than reflect it. Might this perhaps suggest that reducing particulate pollution in Asia would be as important as reductions in greenhouse gas emissions?[17]

Finally, a study published in *Science* magazine in April found that 87 percent of Antarctic glaciers have retreated in the past 61 years in a pattern "compatible" with atmospheric warming, but added the caveat that "present changes could be part of longer cyclic behavior," and that warming "may not be the sole driver of glacier retreat in this region."[18]

- Additional confusion about ice melt and sea-level rise came from contrasting articles in consecutive editions of *Nature* magazine in early January of this year. The January 17 issue carried a news story entitled

CONTINUED ON PAGE 34

Finally, in other climate policy news that is hard to categorize, we take note of British Airways, which in September began offering passengers the option of paying a small surcharge on their airfares to offset the carbon emissions from their trip. The surcharge would go toward buying and retiring emissions credits in the European carbon-trading program. *The Economist* reported in late October, "Last week the airline admitted that, so far, hardly anybody seems interested."[25] Fewer than one in 200 passengers was willing to cough up. "That sits oddly with people's professed anxiety in polls about climate change."

HIGHLIGHTS, FROM PAGE 33

"Sea-Level Rise Is Quickening in Pace," reporting on a study in the January issue of *Geophysical Research Letters* by two Australian scientists that offered confirmation that the sea level is on course to rise about 30 centimeters over the course of the 21st century, as the IPCC has previously forecast.[19] A week later, *Nature* published a study from British and German scientists whose new model predicts that sea-level rise will only be half as much as the IPCC forecast.

- Carbon sequestration, the complement or alternative to emissions reductions, received fresh attention in studies by the Pew Center on Global Climate Change and the IPCC. The Pew study examined the economics of forest-based sequestration (in plain English, soaking up carbon by planting more trees) in the U.S., concluding that 500 million tons of CO_2 per year could be sequestered at a cost ranging from $30 to $90 a ton, bringing the annual cost to $15-$45 billion.[20] These costs are judged to be comparable to the costs of emissions reductions.

  The IPCC, meanwhile, took a broader approach, issuing a study about the prospects for more aggressive carbon sequestration options such as capturing carbon dioxide at the source (power plants, for example) and injecting it deep underground or at the bottom of the ocean. The IPCC estimated that advanced sequestration technologies could capture up to 40 percent of the world's carbon emissions by the year 2050. However, the technology could be very expensive, and might lead to a doubling of the price of electricity in the U.S.[21] Such an outcome is sure to be sequestered itself.

- Is the "Atlantic Conveyor Belt" getting tripped up? The Atlantic Conveyor Belt, alternately called "thermohaline circulation," refers to the climate effect of the circulation of the Gulf Stream in the Atlantic Ocean. The Atlantic Conveyor Belt brings warmer ocean water northward and thereby assures a temperate climate to northern Europe, which would otherwise be a much colder place. Climate modelers have speculated that changes in freshwater flows into the Atlantic Ocean from melting polar ice could disrupt the Atlantic Conveyor Belt and, ironically, lead to a severe drop in average temperatures in Europe. (Skeptics doubt that enough freshwater could have such a large scale effect.) This was the scenario, albeit run at unrealistic warp speed, for the climate-action-adventure movie *The Day After Tomorrow*. In December, *Nature* magazine published a new study reporting evidence that the flow of the Atlantic Conveyor Belt has begun to change in the last 30 years. However, the study's author, Harry Bryden of the National Oceanography Centre in Britain, cautions that the results are based on limited observations and will need to be confirmed through more intensive measurements.[22]

  In January, *Nature* returned to the subject with a battery of articles noting that adequate monitoring of Atlantic Ocean currents and temperatures is only now getting under way. Quirin Schiermeier wrote that "it will be some time before the likelihood, and the probable effects, of a thermohaline circulation slowdown can be predicted with accuracy." *Nature* editorialized that "more measurements are clearly needed if we are to fill the enormous gaps in our knowledge of ocean behavior."[23]

- The other sensational news reported last year in *Science* magazine was the finding, based on new research into Antarctic ice core samples, that greenhouse gas levels are at their highest point in the last 650,000 years. For much of that history, *Science* reported, CO_2 levels never exceeded 290 parts per million (ppm), whereas today, CO_2 levels have reached 375 ppm.[24]

NOTES

[1] Remarks at "Clinton Global Initiative," September 15, 2005 (http:// www.clintonglobalinitiative.org/home.nsf/pt_transcript1)
[2] Tony Blair, "Get Real on Climate Change," *The Observer*, October 30, 2005.
[3] Quoted in *The Independent*, November 15, 2005.
[4] Juliette Jowit, "Britain Opens the Way for New Climate Deal," *The Observer*, November 20, 2005.
[5] David Adam, "Blair Signals Shift Over Climate Change," *The Guardian*, November 2, 2005.
[6] Jonathan Brown, "Tony Blair Comes Under Attack by Eco-Warriors," *The Independent*, November 14, 2005.
[7] Thomas Wagner, "U.S. Appears to Win Global Warming Debate," Associated Press, July 8, 2005.
[8] http://www.publications.parliament.uk/pa/ld200506/ldselect/ldeconaf/12/12i.pdf. The Lords' committee included two ex-governors of the Bank of England, two former Chancellors of the Exchequer, and two economists.
[9] Quirin Schiermeier, "The Costs of Warming," *Nature*, January 26, 2006; see also "Warming to Economists," unsigned editorial, *Nature*, January 26, 2006: "Unfortunately, for the purposes of its impending fourth assessment, the IPCC won't manage to incorporate the economists' latest thinking on these different 'emissions scenarios.'"
[10] See www.sternreview.org.uk.
[11] Clinton quoted on http://greenspin.blogspot.com, December 11, 2005.
[12] Andrew C. Revkin, "On Climate Change, a Change of Thinking," *New York Times*, December 4, 2005.
[13] Asia-Pacific Partnership on Clean Development and Climate, *Ministerial Communique*, January 2006.
[14] Richard C. Newell and Nathan E. Wilson, "Technology Prizes for Climate Change Mitigation," Resources for the Future Discussion Paper #05-33 (June 2005), available at http://www.rff.org/rff/Documents/RFF-DP-05-33.pdf.
[15] D. H. Douglass, and R. S. Knox (2005), Climate forcing by the volcanic eruption of Mount Pinatubo, *Geophysical Research Letters*, 32, L05710, doi: 10.1029/2004GL022119.
[16] J. Esper, et al., 2005. Climate: past ranges and future changes. *Quaternary Science Reviews*, 24, 2164-2166.
[17] Dorothy Koch and James Hansen, "Distant Origins of Arctic Black Carbon: A Goddard Institute for Space Studies Model Experiment," *Journal of Geophysical Research*, Vol. 110, No. D4, D04204, doi:10.1029/2004JD005296, February 25, 2005. See also Harangozo, S. A. (2006), Atmospheric circulation impacts on winter maximum sea ice extent in the west Antarctic Peninsula region (1979–2001), *Geophys. Res. Lett.*, 33 (2006), L02502, doi:10.1029/2005GL024978, which concludes that wind patterns have much to do with changes in Antarctic ice masses.
[18] A.J. Cook, et al., "Retreating Glacier Fronts on the Antarctic Peninsula over the Past Half-Century," *Science*, Vol. 308 (April 22, 2005), pp. 541-544.
[19] J. A. Church, and N. J. White, A 20th century acceleration in global sea-level rise, *Geophysical Research Letters*, 33 (2006), L01602, doi:10.1029/2005GL024826.
[20] Robert N. Stavins and Kenneth R. Richards, "The Cost of U.S. Forest-Based Carbon Sequestration," Pew Center on Global Climate Change, January 2005, available at http://www.pewclimate.org/docUploads/Sequest%5FFinal%2Epdf.
[21] *Carbon Capture and Storage*, a report of Working Group III of the IPCC, September 2005, available at www.ipcc.ch.
[22] Harry L. Bryden, et al., "Slowing of the Atlantic Meridional Overturning Circulation at 25° North," *Nature*, December 1, 2005.
[23] Quirin Schiermeier, "A Sea Change," *Nature*, January 19, 2006; "Circulation Challenge: The Lack of Monitoring of Ocean Currents Must Be Addressed Quickly," *Nature*, January 19, 2006.
[24] Urs Siegenthaler, et al., "Stable Carbon Cycle-Climate Relationship During the Late Pleistocene," *Science*, November 25, 2005; Renato Spahni, "Atmospheric Methane and Nitrous Oxide of the Late Pleistocene from Antarctic Ice Cores," *Science*, November 25, 2005.
[25] "Virtue for Sale: How to Persuade People to Go Green," *The Economist*, October 29, 2005, p. 57.


HELSINGIN SANOMAT
Voimassa Ainoastaan AINA
NÉPSZABADSÁG
Esőt ígér Medárd
Sólyom László lesz a köztársaság elnöke
Bedava Gemi Bileti
Milliyet'ten herkese
BUGÜN Karayolu haritası
Böylesi verilmedi
Hürriyet
Berlin'in büyük ayıbı
LA SERA
TURF

BLACK INK, GREEN NEWS: *Media Roundup 2005*

The media roundup of this report was launched with the 8th edition in 2003, and the very first item it noted was a spurious *New York Times* news story on an Indian Ocean island and "endangered giant sea sparrows." Trouble was, neither the island nor "giant sea sparrows" exist. The *Times* had sloppily reported a hypothetical as fact, and had to print an embarrassing correction.

This year's first-prize winner for sloppy environmental reporting is the *Los Angeles Times*, which in December printed an April Fool's Day hoax in a front-page news story on endangered wolves. "In Wyoming, for example," the story read, "Gov. Dave Freudenthal last April decreed that the Endangered Species Act is no longer in force and that the state 'now considers the wolf as a federal dog,' unworthy of protection."[1] The reporter, Julie Cart, read the spurious quote on the Internet (it was the product of a sports outfitter in Afton, Wyoming), but didn't bother to check it out, despite its April 1 date.

It is one thing, perhaps, if a harried and inexperienced reporter with a smallish newspaper such as the *Kalamazoo Daily Celery Stalk* or the *Bungtown Bird of Freedom* swallows a whopper, but the *Los Angeles Times* boasts of having every news story reviewed and checked out by four editors before publication.[2] Fortunately, as we shall see shortly, the *Los Angeles Times* redeemed itself with a number of excellent environmental news features in 2005.

At least the *Times*' error wasn't as egregious as the media's coverage of Hurricane Katrina, which Dave Roberts of the environmental website Grist.org named as the top environmental news story of 2005.[3] As was subsequently acknowledged, much of the reporting on Katrina, from a number of front-line journalists from the major print and broadcast organizations, was wrong by orders of magnitude. Numerous stories reported that there was widespread mayhem—rapes, murder, infanticide—occurring at the New Orleans Convention Center, yet when the much-maligned Federal Emergency Management Administration, believing the media reports to be accurate, showed up with three doctors and a refrigerated 18-wheeler to process the estimated 200 bodies, they found only six dead. One person had committed suicide, one died from a drug overdose, and four died of natural causes. There was no evidence of murder, and there were no child victims.

The Katrina story offers a good example of how inaccurate or sensational reporting can have deleterious consequences. The New Orleans police chief, Eddie Compass, said later that media reports resulted in scarce resources being diverted from real emergencies to emergencies that did not exist. Might the same thing be said of careless or sensational environmental reporting? Katrina itself offers a good case study.

The media seemed to learn little from its failures of reporting during the flood, and extended its carelessness in its reporting about the environmental aspects of the story. The AP wrote early in the crisis: "Estimates have been made of tens of thousands of deaths from flooding that could overrun the levees and turn New Orleans into a 30-foot-deep toxic lake filled with chemicals and petroleum from refineries, and waste from ruined septic systems."

The *Washington Post* ran a by-the-numbers editorial predictably entitled "Toxic Soup," which became the favored phrase to describe the combination of sewerage, chemicals, and oil byproducts

released in the maelstrom. "No one knows what chemical reactions might take place in that water," the *Post* wrote. While warning that we should not "engage in scaremongering" because "ecosystems do recover from disasters, both natural and man-made," the *Post* then went on to engage in scaremongering:

> But because this kind of water pollution is unprecedented, and because it could cause permanent damage to drinking water, agriculture and the fishing industry in the region—and could damage the region's viability and habitability—it is extremely important that the EPA continue its daily monitoring of the floodwaters, while they remain in the city and after they have been pumped out.[4]

The *Post* had it right the first time—ecosystems are more resilient than we think, and subsequent testing of Lake Ponchartrain showed much lower levels of harmful pollution than expected. A study released in October in the journal *Environmental Science and Technology* found that New Orleans floodwaters were not unusually toxic and were "typical of storm water runoff in the region."[5] No fish kills were reported in Lake Ponchartrain, where much of the floodwaters were pumped. "We still don't think the floodwaters were safe, but it could have been a lot worse," environmental engineer John Pardue told the *Washington Post,* "It was not the chemical catastrophe some had expected."[6]

This is entirely consistent with the experience several past environmental disasters, including the 1969 Santa Barbara oil spill, the 1989 *Exxon Valdez* oil spill, the 1984 dioxin scare in Times Beach, Missouri, and, as we learned recently, the 1986 Chernobyl nuclear explosion, where lasting environmental damage was initially overestimated.[7] However, we can expect that large numbers of the public will only remember the initial media reports, and will persist for a long time in believing that a massive "toxic soup" was discharged into the Gulf of Mexico.

Meanwhile, the media (with notable exceptions such as Michael Grunwald of the *Washington Post* and Ralph Vartabedian and Peter Pae of the *Los Angeles Times*)[8] largely failed to provide the public with much information about the most salient environmental aspect of the Katrina story: the rapid and dramatic shrinkage of the Louisiana coastline during the 20th century. The Louisiana coastline has been losing an estimated 34 square miles of land a year for the last 50 years; the U.S. Geological Survey estimates that Katrina erased 30 square miles of coastal land.[9] In the last 75 years Louisiana has lost a land area the size of Delaware. Last year's report of the U.S. Commission on Ocean Policy noted that Louisiana accounts for 80 percent of total coastline erosion in the entire U.S.[10] A contrast of an older map of Louisiana with a current satellite photo of the actual coastline is jarring.[11]

The erosion of the low-lying coastal marshlands eliminated natural barriers to storm surges, and has reduced the river basin's ability to dilute and filter out pollution naturally, which has contributed to the worsening problem of hypoxia (nitrogen runoff that depletes dissolved oxygen and creates a "dead zone") in the Gulf of Mexico. It also accelerated subsidence in and around New Orleans, increasing the area's hurricane risk. The cause of this erosion is not mysterious: the vast system of dams, levees, canals, artificial channels, and flood control projects stretching all the way to the headwaters of the Mississippi River in the upper Midwest has reduced the amount

of sediment reaching the mouth of the Mississippi by two-thirds. In addition, the channelization of the Mississippi around New Orleans and its mouth into the Gulf of Mexico ensures that what sediment still flows ends up mostly out in the Gulf, where it disappears out beyond the continental shelf. For thousands of years the Mississippi River's mouth could be likened to a loose garden hose, changing its course rapidly and dispersing sediment widely. Restoring the region's ecosystem requires finding ways to mimic this long-term dynamic process.

When the media turned to environmental aspects of Katrina, the focus was (in addition to "toxic soup") global warming. Ross Gelbspan wrote in the *Boston Globe:* "The hurricane that struck Louisiana yesterday was nicknamed Katrina by the National Weather Service. Its real name is global warming. . . . As the atmosphere warms, it generates longer droughts, more-intense downpours, more-frequent heat waves, and more-severe storms."[12] Sir David King, Prime Minster Tony Blair's science adviser, told a British TV reporter that "[t]he increased intensity of hurricanes is associated with global warming."[13] Even the European Parliament got in on the act, passing a resolution that "[e]xpresses its deepest sympathy with the families of the victims and notes with regret that *the often predicted impact of climate change has become a reality* in that poor sections of society living in coastal regions bore the brunt of the hurricane." (Emphasis added.)

The public appears not to have been greatly swayed by this frothy coverage. A CNN/*USA Today*/Gallup poll taken in mid-October, six weeks after Katrina, found that 36 percent agreed with the statement that "global warming has been a major cause of the increase in hurricanes," while 30 percent said it was "not a cause" and another 29 percent said it was a "minor cause."[14] An ABC News/*Washington Post* poll taken three weeks after Katrina asked, "Do you think the severity of recent hurricanes is most likely the result of global climate change, or is it just the kind of severe weather events that happen from time to time?" Fifty-four percent chose "just happens," while 39 percent chose "climate change."[15]

NOTABLE NEWS FEATURES OF 2005

We found a number of worthy examples of environmental progress and reports from a contrarian point of view in the major media in 2005. Among them are:

- Jim Carlton, "Rancher Turns the Table: Environmental Group Loses Lawsuit Filed by Cattleman; Case of the Dueling Photos," *Wall Street Journal,* August 19, 2005.

  Carlton, who covers the western ranching beat for the *WSJ*, writes about the case of Arizona rancher Jim Chilton, who successfully sued the Center for Biological Diversity for defamation. A jury award ordered the Center to pay Chilton $600,000, including $500,000 in punitive damages (the Center is appealing). The Center has made a practice of suing ranchers who hold grazing permits on federal land, alleging damaging environmental practices and hoping to curtail grazing on federal lands, and often posting photos on damaged landscapes on its website. Chilton noted anomalies in the photos of his allotment, and discovered previous photos of one particular area showing a large camp-out underway with numerous vehicles on site. (One of the

Center's executives was present at the camp-out.) "The 66-year-old Chilton's adoption of the green groups' own methods shows how the environmentalists' techniques can be turned against them," Carlton writes. "His case, if upheld, could spark a legal uprising by ranchers against environmentalists, experts say." Chilton says that if he collects his judgment from the Center for Biological Diversity, he'll use the proceeds to start a legal fund to help other ranchers defend themselves from environmental lawsuits.

- Antonio Regalado, "In Climate Debate, the 'Hockey Stick' Leads to a Face-Off: Nonscientist Assails a Graph Environmentalists Use, And He Gets a Hearing; Defenders Call Attack Political, " *Wall Street Journal*, February 14, 2005.

  The debate over the so-called "hockey stick" graph, which purports to show that world average temperatures in the last three decades have been the warmest in the last 1,000 years, turns on arcane and esoteric statistical techniques that are beyond the grasp of most laypeople. Regalado waded into the controversy and produced a balanced and accessible overview of the controversy. Regalado notes formidable critics such as the head of statistics for Environment Canada, who told Regalado that the methodology behind the hockey stick "preferentially produces hockey sticks when there are none in the data." Regalado also cites the defenders of the hockey stick, who say its critics are politically motivated. Regalado's story is one of the very few in the major media to attempt to deconstruct this key controversy in climate science.

- Miguel Bustillo, "Smog Cops to Look for Emissions of Guilt: Sensors Scattered Along Southland Roadways Will Monitor Exhaust; The State Will Help Pay to Replace or Repair Fume-Belching Clunkers," *Los Angeles Times*, August 14, 2005.

  Bustillo has written numerous "outside-the-box" features on air pollution in California, and continues his fine work with this feature on remote sensing, which is an alternative to the "smog check" programs beloved of bureaucrats and auto repair shops. Bustillo notes what has long been known by most air-quality experts—that a small portion of the automobile fleet (about 10 percent) generates 50 percent of total emissions. But the biannual smog check program catches these cars very slowly and unevenly. Bureaucrats at both the EPA and at California's Air Resources Board (CARB) have long resisted using on-road remote sensing to catch these "gross emitters" more quickly. This resistance is finally starting to erode, as air districts in California are experimenting with remote sensing.

- Elizabeth Douglas and Gary Cohn, "What's Driving Gas Prices?", Part 1: "Refiners Maintain a Firm but Legal Grip on Supplies: Clean-Gas Mandates Thinned the Competition a Decade Ago; Companies That Stayed 'Take Advantage of the Crazy Rules' and Enjoy Huge Profits," *Los Angeles Times*, June 18, 2005.

  This three-part series on gasoline prices began with a look at how the regulations requiring "boutique" gasoline blends work to the advantage of refiners. Most consumers think we have three kinds of gasoline in the U.S.—regular unleaded, mid-grade, and premium. In fact, there are more than 70 different blends of gasoline sold in the U.S., with California having its own special

blend not used in any other state. (This also means that Arizona, Nevada, and Oregon gasoline cannot be sold in California.) This is one of the factors behind gasoline prices in California that are 30 to 40 cents a gallon higher than the national average. After opposing the clean fuel requirements for many years, oil companies came to embrace the custom fuels when they figured out that they could make higher profits and reduce competition. However, the benefit of clean fuels have diminished as auto emissions control technology has improved.

- David Cohn, "Global Warming's Silver Lining," *Wired.com*, March 28, 2005.

  Media coverage of global warming is almost exclusively focused on the potential disasters it may entail, such as sea-level rise and an increase in infectious diseases. David Cohn takes a contrary look at the possible *benefits* of a warmer world: "Some researchers believe the benefits of Earth's warming will help compensate for the harmful consequences." These include a longer growing season in northern agricultural areas and a more congenial climate in the northern latitudes such as Siberia and Canada. Cohn cites Benny Peiser, a social anthropologist at Britain's Liverpool John Moores University, who takes the heterodox view that "the benefits [of warming] outweigh the costs by far."[16]

- Gina Kolata, "Environment and Cancer: The Links Are Elusive," *New York Times*, December 13, 2005.

  Health and science reporter Kolata debunks popular perceptions of the link between environmental chemicals and cancer. (See the Toxics section of this *Index* for more on Kolata's reporting.)

NOTABLE EDITORIALS AND COLUMNS OF 2005

- Orson Aguilar, "Why I Am Not an Environmentalist," *Pacific News Service Commentary*, May 16, 2005.

  Aguilar, director of a community development organization, takes aim at environmentalists who have "pointedly avoided addressing my community's desperate need for economic development. Environmentalists do not talk about the importance of a living wage or affordable housing because, we are told, those are not environmental problems." Aguilar takes special aim at the Sierra Club for opposing a bill in the California legislature designed to encourage brownfield redevelopment in urban areas, even though such development would relieve pressure for sprawl. "Until environmentalists put economic development on their agenda along with protecting the planet, people from low-income communities will have trouble calling themselves green."

- Gregg Easterbrook, "Clear Skies, No Lies," *Los Angeles Times*, February 16, 2005; and "Red and Green," *The New Republic Online*, February 14, 2005.

  Perennial contrarian Gregg Easterbrook occupies very nearly a permanent pole position in the *Index of Leading Environmental Indicators* annual media review, and lives up to his billing with

this op-ed noting that if "Al Gore had become president and proposed a law to cut pollution from power plants by about 70 percent at a low cost, to discourage the lawsuits that often stall clean-air rules from being enforced, and to serve as a model for a future system to regulate greenhouse gases," he would have been widely praised by environmentalists and the media. Instead, the Bush proposal to enact a wide-scale tradable emissions system—a possible model for a greenhouse gas tradable emissions program—has fallen victim to the most shallow sort of partisan politics. In "Red and Green," Easterbrook notes that the Bush Administration program to reduce emissions of methane—the most potent greenhouse gas—has been unappreciated, again chiefly because of politics. "The world's first international anti-global-warming agreement to take force is not the Kyoto treaty. It is a Bush Administration initiative, and you have not heard a peep regarding the initiative because the American press corps is pretending it does not exist."

- Hans von Storch and Nico Stehr, "Exaggerated Science: How Global Warming Research is Creating a Climate of Fear," *Der Spiegel*, January 24, 2005.

  Hans von Storch, director of the GKSS Institute for Coastal Research in Geesthacht, Germany, and Nico Stehr, a sociologist at Zeppelin University in Friedrichshafen, argue that "a spiral of exaggeration" now characterizes scientific discussion of climate change, in which "every prediction has to trump the last." Their conclusion is blistering: "[S]cientists are succumbing to a form of fanaticism almost reminiscent of the McCarthy era. In their minds, criticism of methodology is nothing but the monstrous product of 'conservative think-tanks and misinformation campaigns by the oil and coal lobby,' which they believe is their duty to expose. In contrast, dramatization of climate shift is defended as being useful from the standpoint of educating the public. . . . Science is deteriorating into a repair shop for conventional, politically opportune scientific claims."

- Anthony Flint, "The virtues of sprawl: Sprawl isn't what it used to be, some experts contend. Is it time we stopped worrying and learned to love the subdivision?" *New York Times*, October 2, 2005.

  Flint organizes his column around the findings of Robert Bruegmann's fine new book, *Sprawl: A Compact History*, and Joel Kotkin's book, *The City: A Global History*, and agrees with Bruegmann and Kotkin that what is pejoratively called "sprawl" has deep roots in human social and economic needs.

- Robert J. Samuelson, "Greenhouse Hypocrisy," *Washington Post*, June 29, 2005.

  Samuelson, economics columnist for *Newsweek* and the *Post*, delivers a stinging column right out of the "emperor's new clothes" school of journalistic debunking. "Almost a decade ago," Samuelson wrote, "I suggested that global warming would become a 'gushing' source of political hypocrisy. So it has. . . . But all this sound and fury is mainly exhibitionism—politicians pretending they're saving the planet. The truth is that, barring major technological advances, they can't (and won't) do much about global warming. It would be nice if they admitted that, though this seems unlikely. . . . The media participate in the resulting deception by treating their gestures seriously. One danger is that some of these measures will harm the economy without producing significant environmental benefits. Policies motivated by political gain will inflict public pain. Why should anyone applaud?"

- Holman W. Jenkins Jr., "Dear Valued Hybrid Customer," and "Prius Follies, Take Two," *Wall Street Journal,* November 20 and December 14, 2005.

  This pair of columns from the *WSJ*'s Wednesday "Business World" columnist casts a well-deserved jaundiced eye at the hype for hybrid cars. Jenkins notes that the marketing hype for hybrids exceeds their actual on-road performance: most people get as much as 25 percent less gas mileage than the sticker rating, and the current price premium for hybrid cars will not yield savings in gas unless gas prices reach $10 a gallon. The next generation of hybrid cars, such as SUVs and pickups, may not get any superior gas mileage, but will use their hybrid synergy drives to increase horsepower. Jenkins' first column ignited a firestorm of reader criticism from hybrid fans, so he extended his argument in the second column, "Prius Follies, Take Two."

  Jenkins concludes: "That leaves carbon dioxide, aka greenhouse gas, to support the increasingly rickety rationale for treating fuel efficiency as a socially desirable end in itself. Here we can only suggest Prius fans might do the planet more good by convincing the American public of the merits of nuclear energy, the closest thing to a genuinely 'green solution' to energy challenges in the real world."

- "Economic Man, Cleaner Planet," unsigned leader, *The Economist,* September 27, 2005.

  The Economist provides arguably the most literate environmental coverage of any major media outlet, and does not disappoint with this extended essay on why environmentalists should more fully embrace markets and property rights as a primary tool for environmental protection. The editors put the problem with admirable clarity and concision: "Governments everywhere have tended to follow a heavy-handed 'command-and-control' approach that sets impossibly lofty environmental goals and requires needlessly expensive responses or rigid technological fixes. . . . Yet, even as the actual air has got cleaner, the metaphorical atmosphere has been poisoned by the confrontational approach enshrined in such laws. For decades, the prevailing attitude of governments' environmental agencies, especially in America, seems mostly to have been one of hostility to industry. The resulting policies encouraged litigation and stifled innovation. . . . Slowly but surely, governments around the world are rethinking the 'command-and-control' approach. Instead, they are tinkering with various types of market-based policies, ranging from green taxes to tradable permits to pollute. If they stick with it, such economic instruments would harness the power of the market for the sake of the planet's health. This could prove nothing short of a revolution."

NEW BLOGS OF NOTE

Two new environmental blogs are worth bookmarking: "Environmental Economics" (env-econ.net), hosted by Tom Haab and John Whitehead, posts comments from 28 outside contributors scattered at universities around the country. The blog describes itself: "The Environmental Economics blog is dedicated to the dissemination of economists' views on current environmental and natural

resource issues. We hope this blog will help bring economists' views on environmental issues further into the mainstream. The intended audience includes the general public and students. Posts are non-technical."

The second blog of note is "Oikos" (greenomics.blogspot.com), hosted by an Australian lawyer, David Jeffery, who works for a government environmental agency. "Oikos" derives its name from the fact that both the words ecology and economics come from the Greek word *oikos*, meaning "home" or "a place to live."

ROGER PIELKE JR. ON MEDIA COVERAGE OF CLIMATE CHANGE

Generic News Story on Climate Change

Instructions to editor: Please repeat the material below every three to four weeks *ad infinitum*.

This week the journal [*Science/Nature*] published a study by a team of scientists led by a [university/government lab/international group] [challenging/confirming] that the earth is warming. The new study looks at [temperature/sea level/the arctic] and finds evidence of trends that [support/challenge] the findings of the Intergovernmental Panel on Climate Change (IPCC). Scientist [A, B, C], a [participant in, reviewer of] the study observed that the study, ["should bring to a close debate over global warming," "provides irrefutable evidence that global warming is [real/overstated] today," "demonstrates the value of climate science"]. Scientist [D, E, F], who has long been [critical/supportive] of the theory of global warming rebutted that the study, ["underscores that changes in [temperature/sea level/the arctic] will likely be [modest/significant]," "ignores considerable literature inconvenient to their central hypothesis," "commits a basic mistake"]. Scientist [A, B, C or D, E, F] has been criticized by [advocacy groups, reporters, scientific colleagues] for receiving funding from [industry groups, conservative think tanks]. It is unclear what the study means for U.S. participation in the Kyoto Protocol, which the Bush Administration has refused to participate in. All agreed that more research is necessary.[17]

NOTES

[1] Julie Cart, "Wolves Thrive but Animosity Keeps Pace," *Los Angeles Times*, December 27, 2005, http://www.latimes.com/news/printedition/front/la-me-wolves27dec27,1,3362193.story?coll=la-headlines-frontpage.

[2] "When I or virtually any other mainstream journalist writes something, it goes through several filters before the reader sees it. At least four experienced *Times* editors will have examined this column, for example. They will have checked it for accuracy, fairness, grammar, taste, and libel, among other things"—the late David Shaw, Pulitzer-winning *L.A. Times* media critic, March 27, 2005.

[3] http://gristmill.grist.org/story/2006/1/1/2277/58757.

[4] "Toxic Soup," *Washington Post*, September 10, 2005, p. A22.

[5] David Brown, "Floodwater Not as Toxic As Feared, Experts Say Metals Seen as Chief Hazard In Survey of New Orleans," *Washington Post*, October 12, 2005.

[6] Ibid.

[7] See Vakeska Stephan, "Chernobyl: poverty and stress pose 'bigger threat' than radiation," *Nature Online*, September 7, 2005, available at http://news.nature.com//news/2005/050905/437181b.html. A study of the after effects of the 1969 Santa Barbara oil spill found that ecological damage was short-lived. See Dale Straughan, ed., *Biological and Oceanographical Survey of the Santa Barbara Channel Oil Spill 1969-1970* (Alan Hancock Foundation, University of Southern California, 1971). *Time* magazine added, "dire predictions seem to have been overstated. . . Now, four months later, the channel's ecology seems to have been restored to virtually its natural state." (*Time*, June 13, 1969, p. 21)

[8] Michael Grunwald, "Money Flowed to Questionable Projects," *Washington Post*, September 8, 2005; Ralph Vartabedian and Peter Pae, "A Barrier That Could Have Been," *Los Angeles Times*, September 9, 2005.

[9] http://www.nwrc.usgs.gov/releases/pr05_006.htm.

[10] The Ocean Commission report also joined the chorus in warning of New Orleans' vulnerability: "New Orleans' protective levees are designed to withstand only a moderate (Category 3) hurricane storm surge. Were they to fail, the city and surrounding areas could suffer upward of $25 billion in property losses and 25,000–100,000 deaths by drowning."

[11] Several vivid depictions of the loss can be seen at http://www.nwrc.usgs.gov/special/landloss.htm.

[12] http://www.boston.com/news/globe/editorial_opinion/oped/articles/2005/08/30/katrinas_real_name/.

[13] http://news.independent.co.uk/world/americas/article309214.ece.

[14] http://www.pollingreport.com/enviro.htm.

[15] Ibid.

[16] http://www.wired.com/news/planet/0,2782,66981,00.html.

[17] http://sciencepolicy.colorado.edu/prometheus/archives/author_pielke_jr_r/index.html#000070.

GROUNDHOG DAY?

In the hit film *Groundhog Day*, the protagonist lives the same day over and over again. The air pollution version of *Groundhog Day* is the view that air pollution is getting worse, and that the Bush Administration is "gutting" the Clean Air Act so that air pollution can increase. At the end of August, readers of the *Washington Post* awoke to yet another front-page story about. . . *New Source Review!* "NEW RULES COULD ALLOW POWER PLANTS TO POLLUTE MORE," was Juliet Eilprin's breathless story that "[t]he Bush Administration has drafted regulations that would ease pollution controls on older, dirtier power plants and could allow those that modernize to emit more pollution, rather than less."[1]

This story refers to the Bush Administration's changes to the Clean Air Act's "New Source Review" (NSR) rules that have been in the offing since Bush arrived in Washington in 2001. Stories like Eilprin's, virtual reprints of press releases from disgruntled environmental activist groups, were a staple of media coverage for the last several years, even as air-pollution levels throughout the U.S. continued to decline. Can there be anything more tiresome than the endless argument over this arcane and contentious feature of the Clean Air Act, especially since two federal courts in 2005 rejected the EPA's aggressive Clinton-era reinterpretation of NSR?

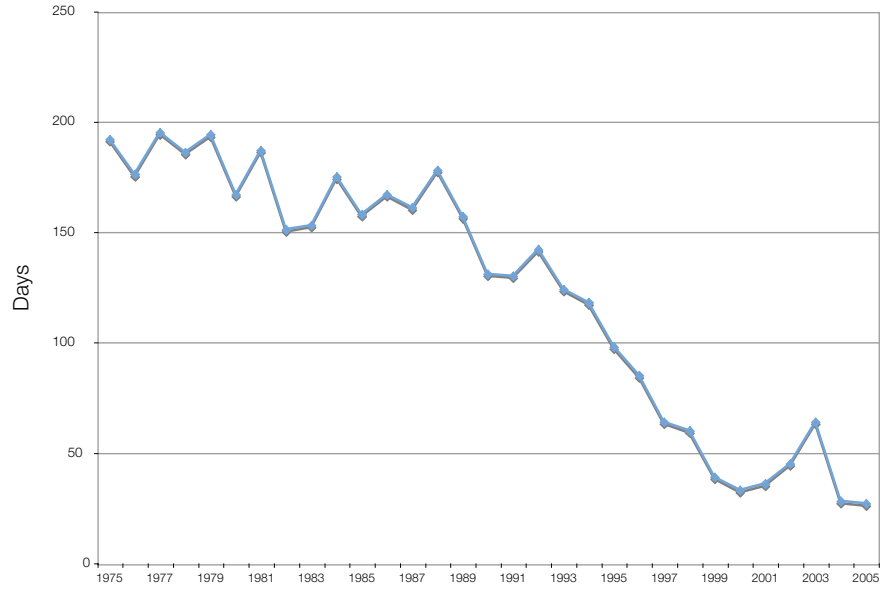
The NSR controversy has been discussed *ad infinitum*, *ad nauseam* in previous editions of this report and elsewhere.[2] Meanwhile, actual air quality trends tend to be ignored by the media, with a few notable and praiseworthy exceptions such as Miguel Bustillo in the *Los Angeles Times* and a handful of other sentient reporters. Last year's edition of the *Index* reported that 2004 came in with the lowest level of ozone smog since monitoring began back in the early 1970s. When all of the data are in, it is likely that 2005 will come in as the second- or third-lowest ozone year, just above or below 2003. In other words, the last three years have seen the nation's lowest ozone levels in history.

In 2005, a hot summer caused more exceedences of the Clean Air Act standard than were experienced in 2004; however, ozone levels remained far below the levels seen in previous summers with above-average temperatures, especially 1988 and 1998. Los Angeles, significantly, had *fewer* exceedences of the ozone standard in 2005 than in 2004, though the *Los Angeles Times* announced that "LA's the Capital of Dirty Air Again," chiefly because Los Angeles's closest rivals, Houston and the San Joaquin Valley, experienced "exceptionally clean air this year."[3]

Figure 1 shows the sharp drop in the number of exceedences of the 1-hour ozone standard in Los Angeles over the last 30 years, from 192 in 1975 to 27 last year. (Los Angeles has also shown significant progress on the recently adopted tougher 8-hour standard, with exceedences dropping from 201 in 1975 to 75 last year. The spike in exceedences seen in 2003 is attributed to a spell of hot weather and atmospheric conditions especially conducive to ozone formation.) This trend actually *understates* the magnitude of improvement since, under EPA rules, an exceedence at just one of the dozens of ozone monitors in the large Los Angeles air basin is enough to qualify as an exceedence for the whole airshed. In fact, there are large areas of the Los Angeles air basin where there have

been no exceedences of the ozone standard for the last several years, meaning millions of residents have had no exposure to high levels of ozone. The EPA has changed its reporting language slightly to take note of this fact.

FIGURE 1. Number of Days Los Angeles Exceeded 1-Hour Ozone Standard, 1975-2005



(Source: CARB)

Beyond Los Angeles, similar progress was observed. In the Washington, D.C., area, not a single "Code Red" day for poor quality was declared over the summer, despite hot temperatures. Washington's experience was typical of the eastern U.S. as a whole. "Ozone levels are falling in 19 Eastern states where smog has been a recurring problem in summer," AP environmental correspondent John Heilprin reported in August. Among other startling facts Heilprin reported was that nitrogen oxide (NO_x) emissions in 19 eastern states had fallen by 50 percent since the year 2000. (For the nation as a whole, NO_x emissions fell nearly 16 percent, as shown in Table 1.)

TABLE 1. Decline in Emissions, 1970-2004

	1970-2004	2000-2004
Carbon Monoxide	– 55.8%	–14.8%
Nitrogen Oxides	–30.1%	–15.7%
Particulates (PM_{10})	–79.5%	+8.7%
Sulfur Dioxide	–51.3%	–6.7%
Volatile Organic Compounds	–55.5%	–11.2%
Lead	–98.6%	0.0%

(Source: EPA)

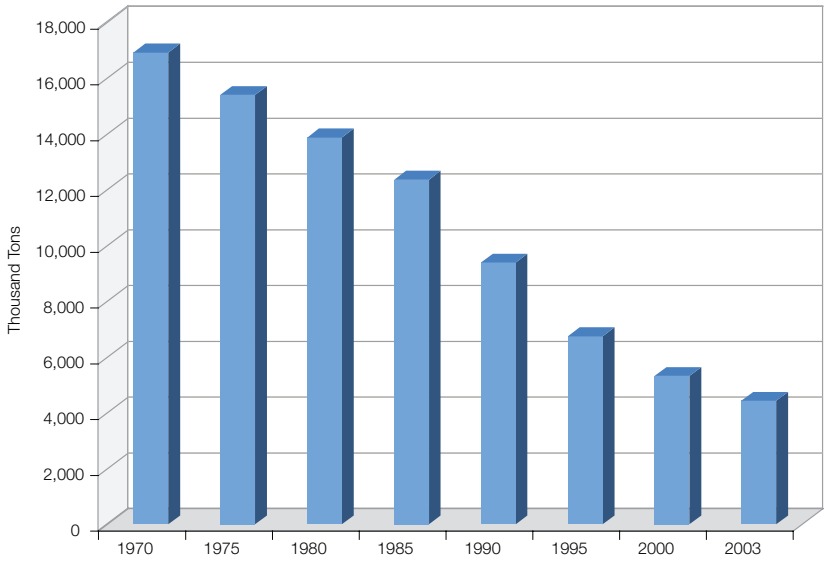
WHERE HAVE THE EMISSIONS REDUCTIONS COME FROM?

Previous editions of this report have highlighted measures of national ambient trends in air pollution. This year we take a slightly different approach, and examine the large declines in emissions, particularly the specific sectors and pollutants where the drops have occurred. The public not only misperceives whether air pollution is falling in general, but is also misinformed about trends with respect to automobiles and power plants. Typical in this regard was a 2003 *USA Today* story, "Smoggy Skies Persist Despite Decade of Work," which proclaimed "One likely reason why the smog isn't lifting: Americans are driving more miles than they did in the 1980s. *And they're driving vehicles that give off more pollution than the cars they drove in the '80s*."[4] (Emphasis added.)

It is rare for a news story to get both the large and small details wholly wrong, but that is entirely typical of news stories about smog. Figure 2 below shows that volatile organic compound (VOC) emissions from cars and trucks have declined by 73.8 percent since 1970, while Figure 3 shows a 64-percent decline in carbon monoxide emissions from cars. During this time period the total number of cars and trucks in the U.S. more than doubled, and the total miles driven increased 181 percent.

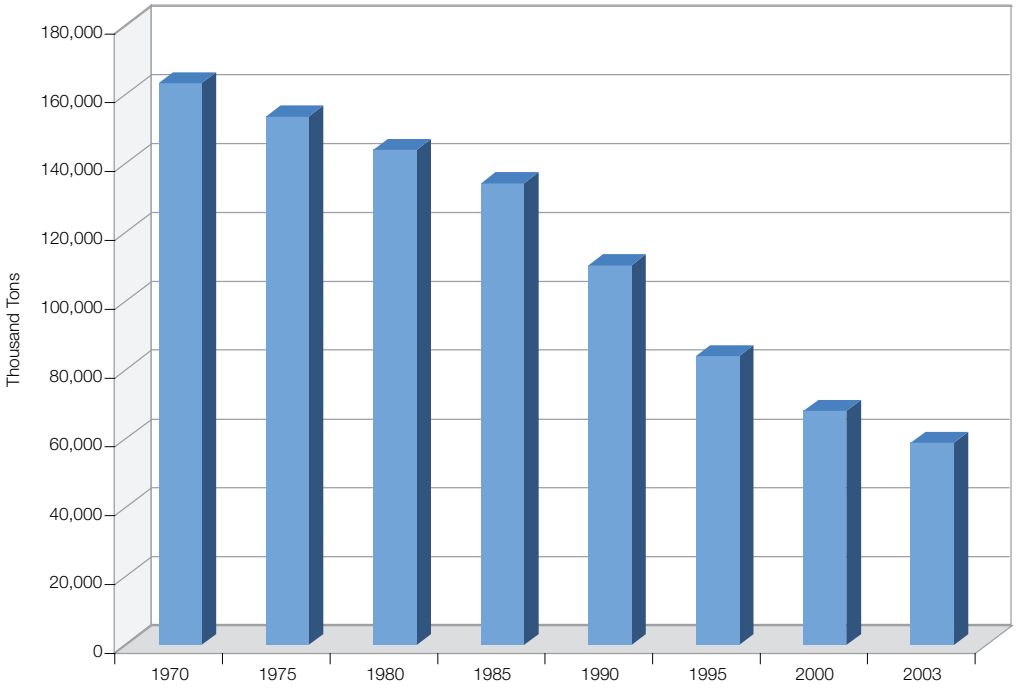
Figure 4 shows how this has happened on the micro level: drawn from data tracked by CARB, it shows that emissions of hydrocarbons (the main component of ozone-forming VOCs) have fallen 99.3 percent since the 1960s. Figure 5 shows a similar trend for automobile tailpipe emissions of carbon monoxide, which have been reduced 96 percent since the 1960s. It is important to note that these emissions rates per mile are not an average for the whole auto fleet, but apply to all makes and models uniformly. In other words, the frequently heard claim that large SUVs "pollute more" is a myth.

FIGURE 2. Total VOC Emissions From Cars and Trucks, 1970-2003



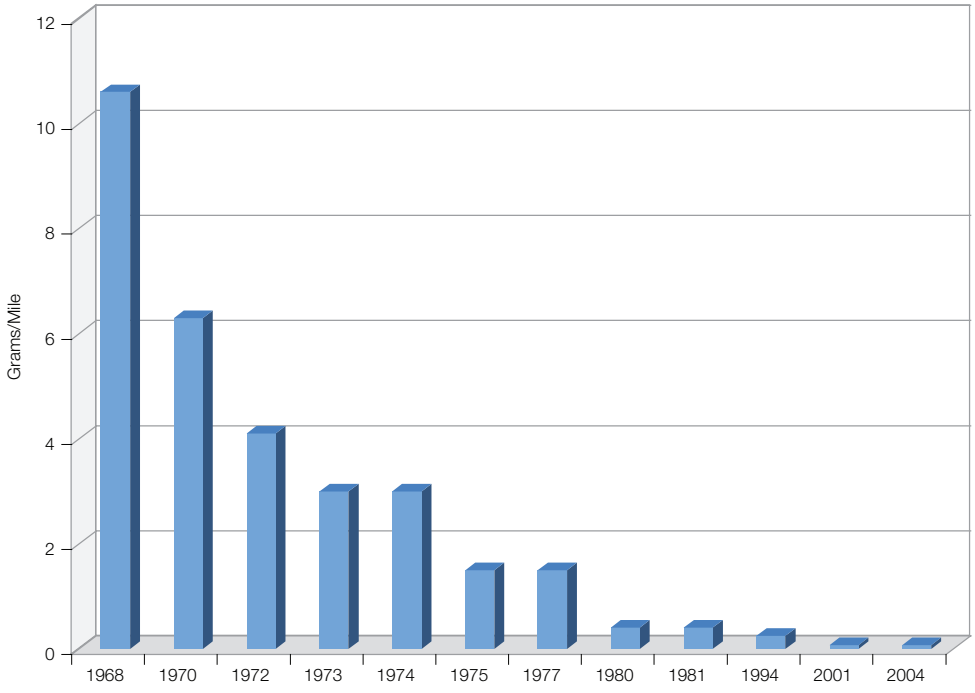
(Source: EPA)

FIGURE 3. Total Carbon Monoxide Emissions from Cars and Trucks, 1970-2003



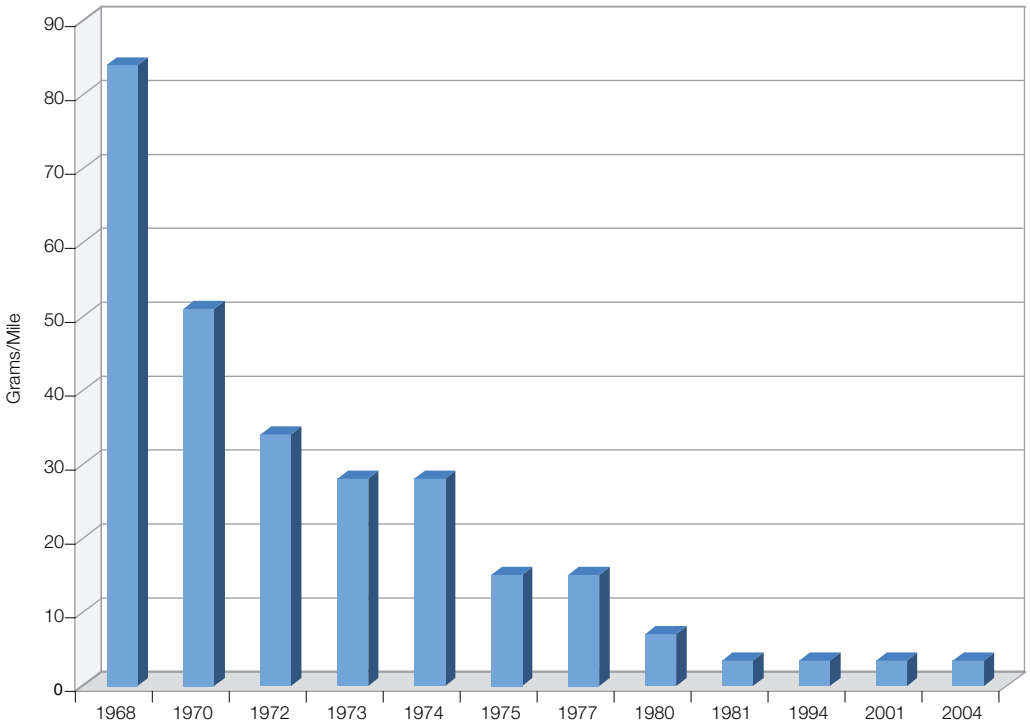
(Source: EPA)

FIGURE 4. Automobile Hydrocarbon Emissions Rate per Mile



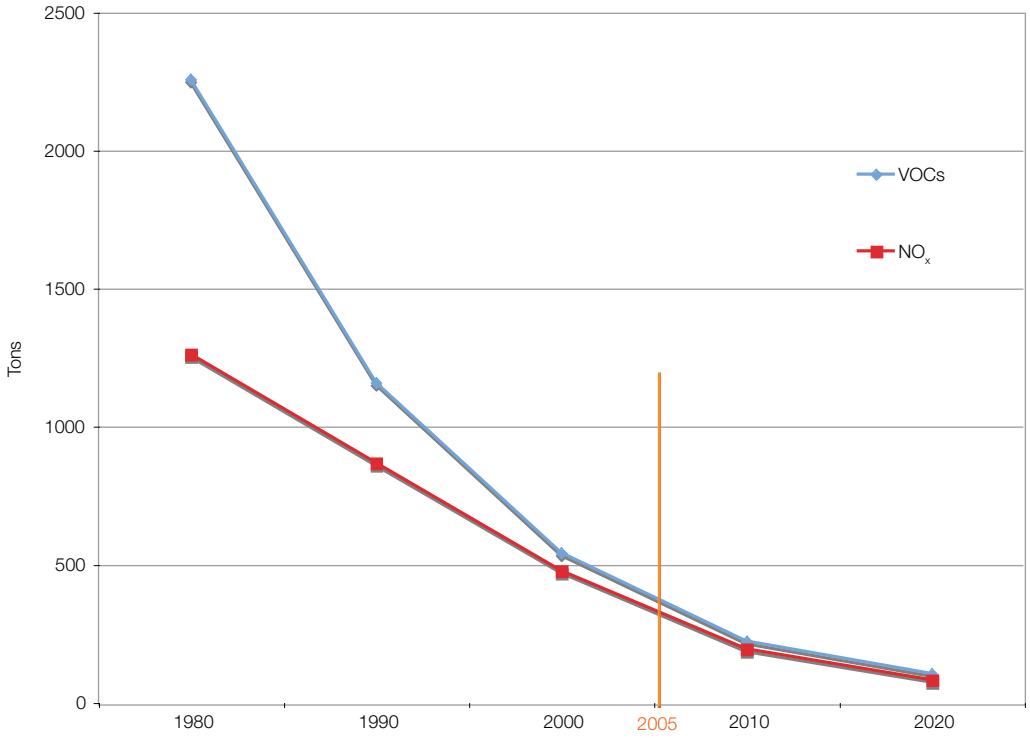
(Source: CARB)

FIGURE 5. Automobile Carbon Monoxide Emissions Rate per Mile



(Source: CARB)

FIGURE 6. Emissions Trends and Projections in California



(Source: CARB)

Finally, both the CARB and the EPA forecast that emissions from autos will fall another 75 to 80 percent from current levels, and will constitute a fraction of total ozone-precursor emissions. California's emissions trends and projections for VOCs and NO_x from cars and trucks are shown in Figure 6. In 1980, emissions from cars and trucks accounted for a third or more of total VOC emissions. By 2020, CARB estimates that mobile source emissions will only account for 5 percent of total VOC emissions.

THE NEXT FRONTIER: COWS AND GRAPEVINES?

To date, reductions in VOC emissions from mobile sources account for two-thirds of the total reduction in VOC emissions achieved so far. Hence it is not surprising that attention is now turning to other sources of VOC emissions. In fact, automobile emissions have fallen so far that it was announced in 2005 that in California's Central Valley, which has the second-highest ozone levels in the nation, cattle are now a larger source of VOCs than cars. The average dairy cow, the San Joaquin Valley Air Pollution Control District estimates, emits 19.3 pounds of VOCs a year.[5] (This is double previous estimates of bovine flatulence.) California's San Joaquin Valley has about 2.5 million dairy cows, which implies a staggering amount of VOCs not previously accounted for in the EPA's emissions inventory. These estimates are disputed, and in any event it is not clear exactly what emissions-control technology could be applied to cows.

Meanwhile, another source of VOC emissions has come to the attention of regulators: California wineries. Once again, the intrepid Miguel Bustillo of the *Los Angeles Times* was first to note the story.[6] There are more than 100 wineries in California's Central Valley, including some of the nation's largest bulk producers such as E.&J. Gallo. According to new estimates these wineries emit almost 800 tons of VOCs a year—again, far more than the auto fleet currently does. The wine industry is concerned that the same kind of emissions-control technology used in the chemical and refining industry can't be made to work with wine fermentation without damaging the wine. Stay tuned. . . and stock up.

The move toward increasing attention on the agricultural sector, which has been largely exempt from air-quality regulatory efforts until now, shows how regulators are moving increasingly to more diffuse and small-scale sources of emissions as the large technological fixes have begun to run their course. Another innovation reported in 2005, for example, is truck stops that are beginning to offer plug-in electricity so trucks can shut down their engines rather than idling for hours.[7] One truck stop in New Jersey that began offering the service in 2004 estimates that it has reduced emissions by 1,400 pounds, and saved 134,000 gallons of diesel fuel. However, it is not cheap: the cost of providing electricity at the stop is estimated to be $1.75 million, a cost currently subsidized by the federal and state governments as a pilot project.

Meanwhile, an Italian company has announced that it has invented "smog-eating cement," an ingredient mixed in with road cement that will absorb up to half of the emissions from cars and trucks. The company, Italcementi, calls its cement additive TX Millennium, and is experimenting with it on highways near the Italian town of Ortisei.[8] TX Millennium supposedly absorbs nitrogen oxides and carbon monoxide, and then transforms these into calcium nitrate and sodium nitrate, which are relatively harmless compounds. But with automobile emissions falling so dramatically, this innovation may be a bit late to the game.

NOTES

[1] *Washington Post*, August 31, 2005, p. A1.

[2] See Steven F. Hayward, "Making Sense of New Source Review," *AEI Environmental Policy Outlook,* July-August 2003, available at: www.aei.org/publications/pubID.18961/pub_detail.asp; Steven F. Hayward, "'Changing All the Rules,' Ignoring All the Facts on New Source Review," AEI *Environmental Policy Outlook,* May-June 2004, available at: www.aei.org/publications/pubID.20588/pub_detail.asp. See also John A. List, et al, "The Unintended Disincentive in the Clean Air Act," *Advances in Economic Policy and Analysis,* Vol. 4, Issue 2 (2004), http://www.bepress.com/bejeap. List and his co-authors conclude that "there are strong disincentives to undertake major plant modifications to avoid NSR," and that "NSR retards modification rates, while doing little to hasten the closure of existing dirty plants."

[3] Miguel Bustillo, "LA's the Capital of Dirty Air Again," *Los Angeles Times,* November 14, 2005.

[4] Traci Watson, "Smoggy Skies Persist Despite Decade of W," *USA Today,* October 16, 2003, p. 1.

[5] Miguel Bustillo, "In San Joaquin Valley, Cows Pass Cars as Polluters," *Los Angeles Times,* August 2, 2005.

[6] Miguel Bustillo, "Wineries Fail the . . . Smog Test?", *Los Angeles Times,* August 22, 2005.

[7] Tina Kelley, "New Tool at Truck Stops Lets Drivers Take Breaks Without Idling, *New York Times,* October 26, 2005.

[8] http://ansa.it/main/notizie/awnplus/english/news/2005-07-19_789541.html.

WATER QUALITY

There is not much to update from previous editions of this report, which have noted the continuing frustration over the lack of adequate water quality data for conducting trend analysis, and the slow pace of developing meaningful indicators. We used to report the findings of the National Water Quality Inventory (NWQI) as the closest proxy to a national indicator of water quality trends, while noting its severe limitations. The EPA has sensibly decided to give up on the NWQI as it has been done for the last 20 years, and has stopped reporting the 50-state data in aggregated form (though individual state reports are available on the EPA's website). The EPA is remarkably frank about the entire problem, stating in the FAQ section of their most recent National Water Quality Assessment Database:

> **Is water quality getting worse compared to 2000?**
>
> It is not appropriate to use the information in this database to make statements about national trends in water quality. The methods states use to monitor and assess their waters and report their findings vary from state to state and even over time. Many states target their limited monitoring resources to waters they suspect are impaired and, therefore, assess only a small percentage of their waters. These may not reflect conditions in state waters as a whole. States often monitor a different set of waters from cycle to cycle. Even weather conditions—such as prolonged drought—can have an impact on whether waters meet their standards from one year to the next.
>
> The science of monitoring and assessment itself changes. We know that a number of states have increased the amount of fish tissue sampling they conduct and, as a result, are issuing more protective fish consumption advisories. We don't think this means necessarily that there are new pollution problems; it's likely that states are able to identify them better as monitoring and analytical methods progress. States may also, over time, change how they issue or count fish consumption advisories.[1]

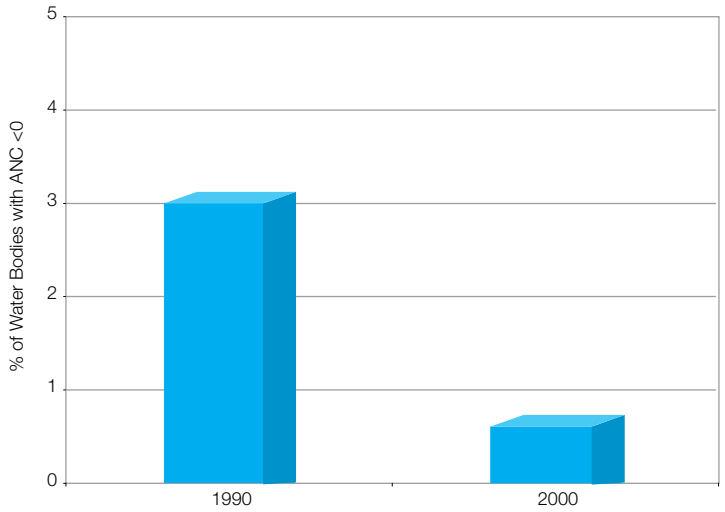
A new EPA effort that is attempting to supplant and surpass the NWQI is worth noting: WATERS, an acronym for Watershed Assessment, Tracking & Environmental Results (epa.gov/waters/). WATERS offers custom Geographic Information Systems user-interface data downloads, but it is limited by relying on state-level reporting, which is the same factor that hobbles the NWQI. The EPA is trying to get states to upgrade the quality of their water reporting. Meanwhile, the most promising national level effort to track water quality trends, the Wadeable Streams Assessment (epa.gov/owow/monitoring/wsa/), is progressing, but has not yet reported results or established a baseline for future trend analysis.

One recent water quality dataset worth a look is the EPA's assessment of lake and stream acidity in the eastern states—one of the chief targets of the 1990 Clean Air Act Amendments. The EPA monitors "Acid Neutralizing Capacity" (ANC) for over 5,000 lakes and 72,000 miles of rivers and streams in the eastern states. The acidity of streams and lakes has more to do with the mineral content of surrounding watersheds than with air pollution *per se*, so the number of lakes and streams with high acidity was fairly low to begin with. This ironically makes the acidity levels a good proxy for declining ambient levels of sulfur dioxide.

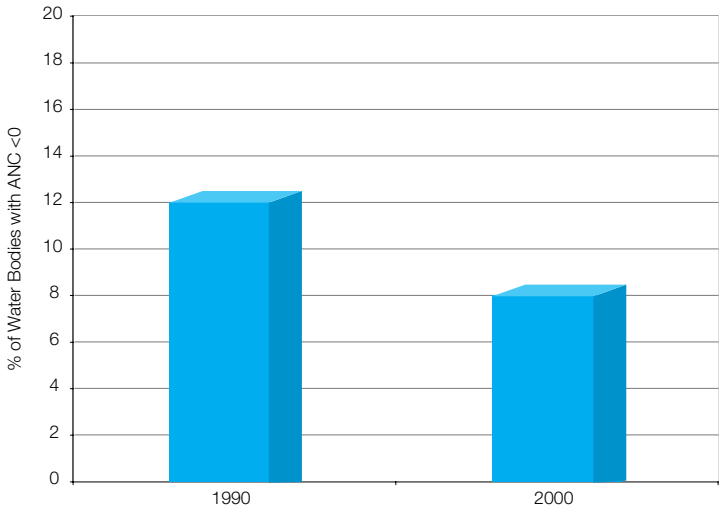
The EPA found significant declines in high acidity in every region except New England, where there was no change from 1990 levels. "Between 1990 and 2000," the EPA reports, "ANC in lakes in the Adirondacks and the Upper Midwest (northeastern Minnesota, northern Wisconsin, and northern Michigan) and in streams in the Northern Appalachians (southern New York, west-central Pennsylvania, and eastern West Virginia) has increased to a degree where approximately 30 percent of the water bodies labeled 'chronically acidic' in 1990 were no longer classified as such in 2000. This increase suggests that surface waters in these areas are beginning to recover from acidification."[2] As the regional figures below show, the decline was largest in the upper Midwest, though this region had fewer acidified waterbodies than did the Adirondacks and Appalachians.

FIGURE 1. Change in Chronic Acidity as Measured by ANC
(Source: EPA)

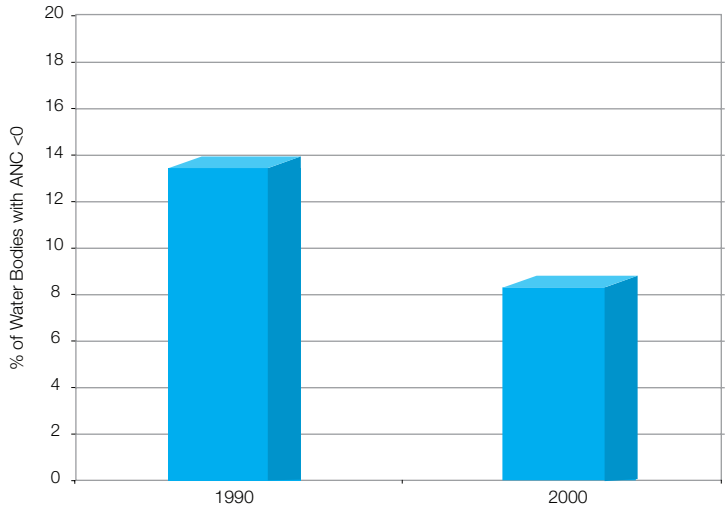
A: Upper Midwest



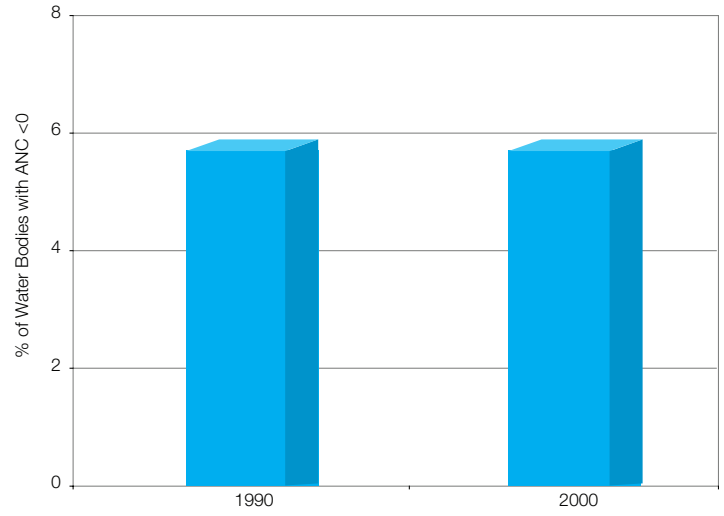
B: Northern Appalachian Plateau



C: Adirondacks



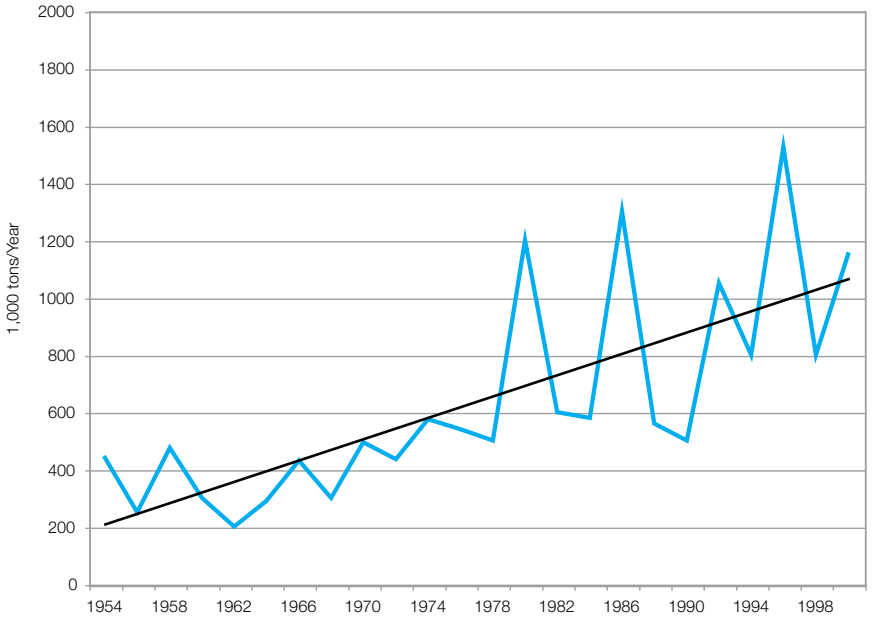
D: New England



GULF HYPOXIA UPDATE

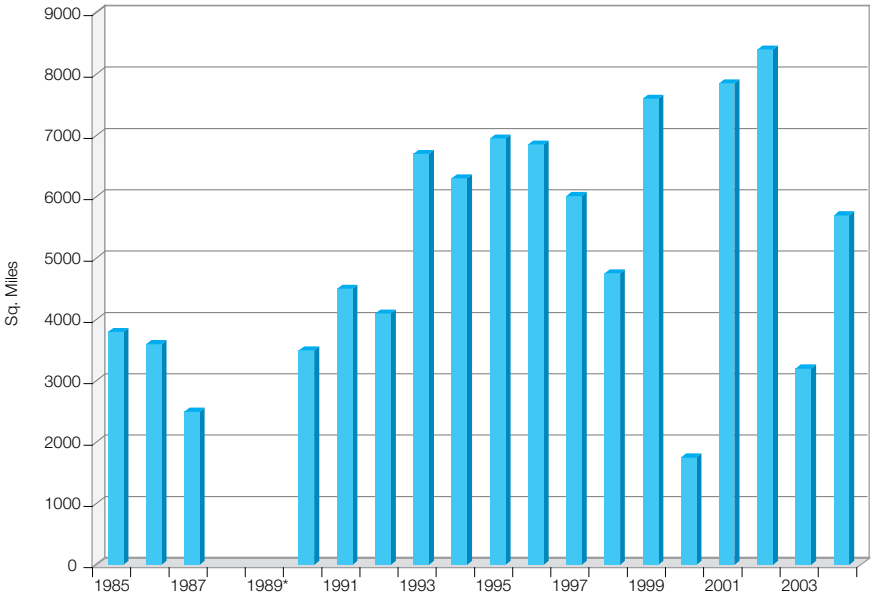
The 8th edition (2003) of the *Index* reported the findings of the Heinz Center on nitrate loadings into the Mississippi River, which are the chief factor in the seasonal hypoxia ("dead zone") in the Gulf of Mexico. (The Heinz Center data are reproduced on the next page, in Figure 2.) The National Oceanographic and Atmospheric Administration (NOAA) has also published data on the extent of hypoxia in the Gulf itself. As Figure 3 shows, there has been considerable year-over-year variation in the extent of hypoxia, with no clear trend. NOAA reports that hypoxia in Long Island Sound has been slightly declining since the mid-1980s (see nos.noaa.gov/Products/pubs_hypox.html; http://dep.state.ct.us/wtr/lis/monitoring/lis_page.htm).

FIGURE 2. Nitrate Loadings on the Mississippi River



(Source: Heinz Center)

FIGURE 3. Estimated Size of Mid-Summer Hypoxia Zone in the Gulf of Mexico



*No data reported in 1989

(Source: NOAA)

NOTES

[1] http://www.epa.gov/waters/305b/assessing_quality.html.
[2] See J. L. Stoddard, et al. *Response of surface water chemistry to the Clean Air Act Amendments of 1990*. 2003. EPA/620/R-03/001, U.S. Environmental Protection Agency, Washington, D.C.

TOXIC CHEMICALS IN THE ENVIRONMENT

CHEMOPHOBIA MAKES A COMEBACK

A revival of toxic fears figured large in environmental news in 2005, with a flurry of major media features on the issue. Most notable was the *Wall Street Journal,* which ran a four-part, front-page series entitled "Toxic Traces: New Questions About Old Chemicals." "For years, scientists have struggled to explain rising rates of some cancers and childhood brain disorders," wrote *WSJ* reporter Peter Waldman. "Something about modern living has driven a steady rise of certain maladies, from breast and prostate cancer to autism and learning disabilities. One suspect now is drawing intense scrutiny: the prevalence in the environment of certain industrial chemicals at extremely low levels."[1]

Perhaps, Waldman's story hypothesizes, there is no safe level for some chemicals in the environment, or, even more troubling, that some chemicals may be more harmful at extremely low levels than at higher levels. (This would track with the theory of "hormesis," reviewed in the 8th and 9th editions of this report in 2003 and 2004.) Waldman's four feature articles surveyed the dueling studies, lab animal tests, and other controversies involving phthalates, mercury, perchlorate, atrazine, and chromium.[2] Although Waldman's stories scrupulously cover all sides of the argument, the premise of the series makes it hard for readers to avoid reaching an alarmist conclusion about the toxic compounds discussed.

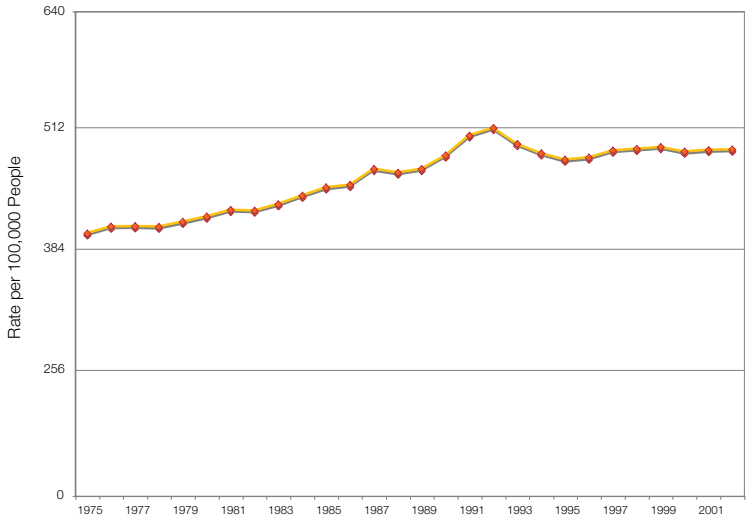
Almost as if in rebuttal to the *Wall Street Journal*, the *New York Times*' health and science reporter Gina Kolata filed a December feature entitled, "Environment and Cancer: The Links Are Elusive."[3] Kolata reported that "most scientists think that only a tiny fraction of cancers might be caused by low levels of environmental poisons," and cited Dr. Richard Peto of Oxford University, coauthor of one of the largest epidemiological studies of cancer in the early 1980s: "Pollution is not a major determinant of U.S. cancer rates." Kolata also reported on a National Institute of Environmental Health Sciences and EPA chemical exposure study of 55,000 Iowa and North Carolina farmers and their families begun in 1993. So far the study has found little sign of increased cancer risk from common agricultural pesticides and chemicals.

The back-and-forth over chemical risk and the periodic revival of media fascination with the subject will always be with us. Meanwhile, data gathering marches on and can give us a wide-angle perspective on the subject. In October the National Cancer Institute (NCI) released a study reviewing cancer rates from 1975 through 2002, showing that age-adjusted rates of all cancers have been flat or falling slightly since 1994, as shown in Figure 1 below.[4] The NCI further reported that cancer death rates have been *declining* by slightly more than 1 percent a year since the early 1970s, after having risen by about 1 percent a year for several decades prior to the 1970s. This improvement is attributed to earlier detection and more effective treatment:

> Progress has been achieved in reducing the cancer burden in the United States. The decline in overall cancer death rates that began in the early 1990s occurred after more than six decades of reported increases in cancer mortality. . . . Before the 1950s, annual cancer death rates for all sites had increased by more than 1% per year until the early 1970s, when they slowed to half this rate; they then began to decrease in 1993 by 1.1% per year. Declines in overall cancer death rates have occurred in both men and women and for many of the 15 most common cancers, including cancers

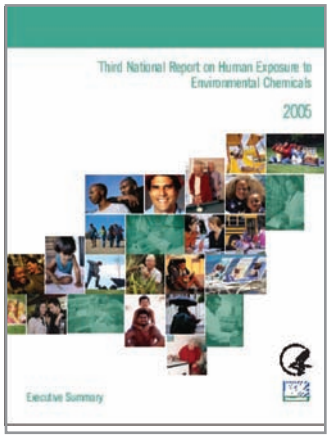
of the lung, colon and rectum, and prostate in men and cancers of the colon and rectum and breast in women. For many cancers, these declines have occurred because of effective prevention and risk-reduction interventions, screening and early detection, and improved treatments and medical management. Nevertheless, the demographic phenomena of aging and increasing size of the U.S. population have contributed to an increase in the absolute total number of cancer deaths.[5]

FIGURE 1. Rates of New Cases of All Cancers



(Source: NCI)

THIRD NATIONAL REPORT ON HUMAN EXPOSURE TO ENVIRONMENTAL CHEMICALS



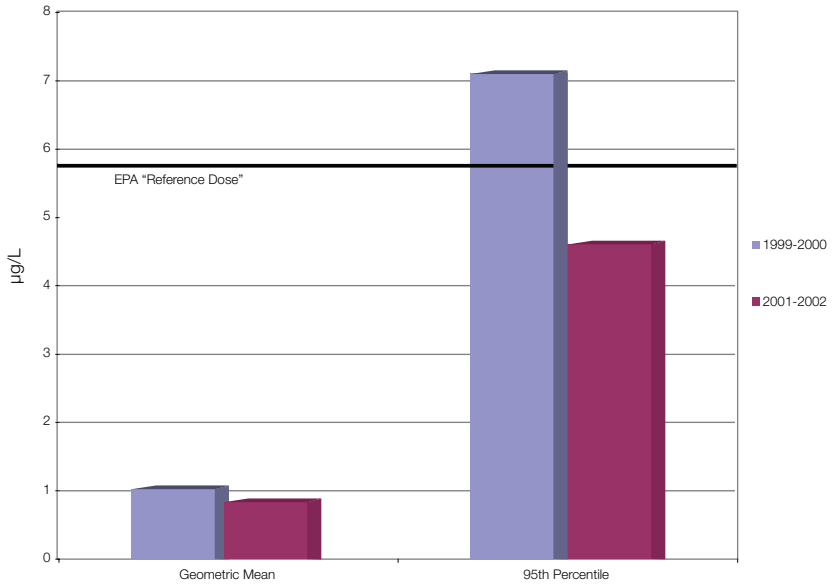
The other important data set to note is the Centers for Disease Control (CDC)'s *Third National Report on Human Exposure to Environmental Chemicals*, released in July of last year.[6] The previous two CDC reports received a reasonable amount of media coverage, but the 2005 report appeared without a trace of media notice. The CDC's third report has expanded the number of chemicals analyzed to 148, up from 116 in the second report published in 2003. The CDC is not yet analyzing differences among the three reports done so far and is not ready to present trends, though it proposes to do so in future reports. In the meantime we can look at a few selected trends.

The CDC reports declining amounts of chemicals in human blood and urine almost across the board. Of prime concern is mercury, which continues to be a focus of controversy as environmentalists charge the EPA is being too lax and dilatory in reducing mercury emissions from U.S. power plants. However, as we noted in the *Index* last year, mercury emissions fell nearly 50 percent during the 1990s. The second CDC

report in 2002 found a small number of women of childbearing years (16-49) with mercury levels above the EPA's "reference dose." (These were found above the 95th percentile; that is, the 5 percent of the sampled population with the highest levels.) The EPA's "reference dose," however, represents a large margin of safety determined by taking the known threshold of harm and dividing by 10. There was no one in the CDC's second report with blood-mercury levels that reached the threshold of known toxicity, a fact the CDC noted in writing that mercury levels "are below levels considered associated with known health effects. . . . Finding a measurable amount of mercury in blood or urine does not mean that the level of mercury causes an adverse health effect."

The EPA's reference dose threshold is designed to take into account uncertainty, and also to serve as an early warning if mercury levels in humans are found to be rising. The new CDC report shows that mercury levels in women of childbearing years are declining, and there is now no one at the 95th percentile above the EPA's reference dose. In the most recent report, women at the 95th percentile showed about a 30-percent drop in mercury levels from the previous report (see Figure 2).

FIGURE 2. Mercury Levels in Women, Ages 16-49



(Source: CDC)

TOXICS RELEASE INVENTORY

The EPA's *Toxics Release Inventory* (TRI), initiated in 1988, is the principal source of data for analyzing the amount of toxic chemicals used in American industry, and its evolution shows the difficulty of developing consistent, objective, and useful information about environmental trends.[7] As the EPA describes it: "The preferred measure of environmental progress is reduction in TRI releases. To the extent that releases are still occurring, another measure of progress may be seen in changes in management practices, in a way that limits potential for human exposure and environmental contamination. We have seen a shift from 2002 to 2003 in how TRI chemical releases are managed."[8]

When the TRI began, it covered only about 300 chemical compounds; in subsequent years the number has grown to more than 650. The number of industries and size of enterprise required to report with the TRI have expanded, and finally included federal facilities recently. More than 24,000 individual facilities must provide information for the TRI, requiring in excess of 80,000 reporting forms.

The EPA emphasizes several important caveats about interpreting TRI data, including gaps in the data and the lack of straight-line applicability of human health risk. For one thing, a "release" for reporting purposes includes chemicals that are disposed properly in hazardous waste landfills, and even chemicals recycled on-site, neither of which are "releases" in the common sense meaning of the term. As such the TRI is really more a measure of the gross amount of toxic chemical inputs and byproducts of American industry.

U.S.–EU COMPARISON ON TOXIC CHEMICALS

The European Environment Agency (EEA) has rough parallels to both the *Toxics Release Inventory* and the CDC's report on human exposure to environmental chemicals. The European equivalent of the TRI is the *European Pollutant Emission Register* (EPER). However, the EPER only went into effect in 2001 and so far has reported results for that year alone, so there is not yet a time series of data to discern and compare trends. Nor is it yet as comprehensive as the TRI, so head-to-head comparisons between the U.S. and the European Union (EU) will be limited for a while to come.

There are some partial datasets available from the EEA of toxic metals and chemicals that show large declining trends similar to the U.S., even though overall chemical production, according to the EEA, has been rising in the last two decades. The EU accounts for almost a third of the world's total chemical production, with chemical output rising faster than the overall economy.

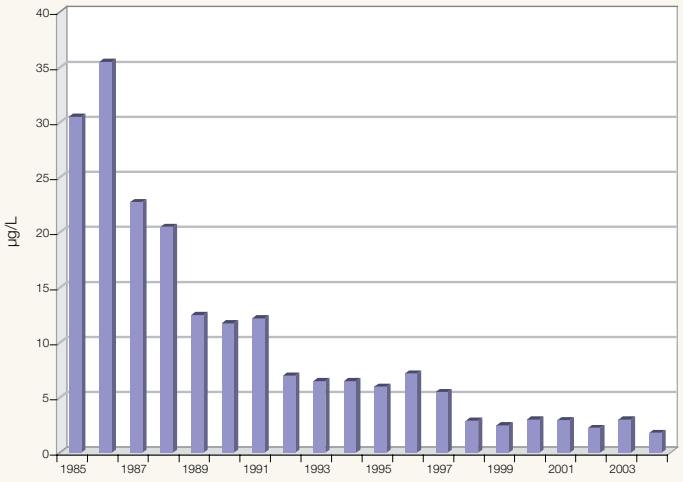
More trend data are available on human exposure to environmental chemicals, though mostly on the national rather than EU-wide level. Germany, for example, established the Environmental Specimen Bank (ESB) in 1985 to track levels of environmental chemicals in humans, similar to the CDC's periodic report.[10] One of the trends the ECB reports is a steady decline in the presence of pentachlorophenol (PCP—a toxic fungicide that Germany banned in 1989) in human blood samples (see Figure 1). This trend follows declining toxic residues of DDT and phthalates reported in the 7th edition (2002) of the *Index*, providing some reassurance about the resiliency of human health. The ESB also reported a 75-percent decline in blood-lead levels from 1984 through 2003, similar to American trends.

Similar to the U.S., mercury emissions in Germany declined by two-thirds from 1985 to 1995, and has resulted in a concomitant decline in mercury levels in wildlife. The 8th edition of the *Index* (2004) noted that mercury levels in bald eagle feathers near the Great Lakes had declined 20 to 30 percent from 1989 to 1999; Germany reported larger declines in herring gull eggs sampled along the Wattenmeer River in the Schleswig-Holstein area between 1988 and 1996, as shown in Figure 2. Arsenic levels in herring gull eggs were also down about 30 percent in that same time period. Germany reported less success, however, with mercury levels on the Elbe River, in part because of cross-boundary pollution from the Czech Republic.

The latest TRI, for the year 2003, emphasizes that "[t]his information does not indicate whether (or to what degree) the public has been exposed to toxic chemicals. Therefore, no conclusions on the potential risks can be made based solely on this information (including any ranking information)."[9] This language—especially the phrase about "ranking information"—appears directed toward advocacy groups that translate TRI numbers into highly misleading and deliberately alarmist propaganda at the local level. Such groups often maintain websites where people input their zip codes to see how much "toxic chemicals" are in their neighborhoods.

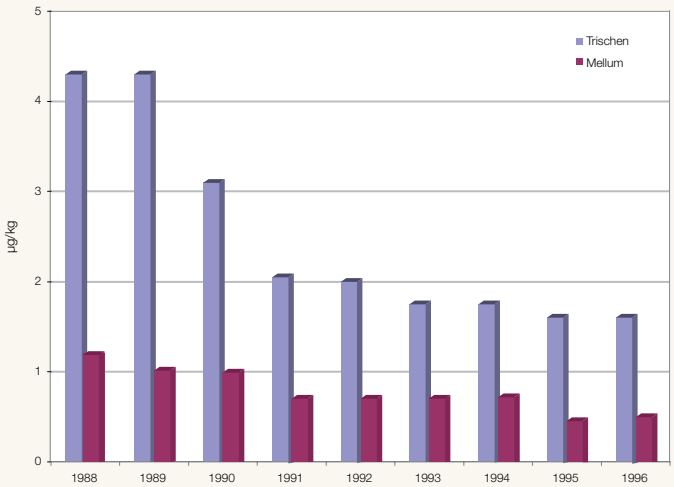
Because of the changes in reporting that have occurred year over year (in the latest report in part due to a court decision), the TRI can be unwieldy to track trends. Fortunately the EPA breaks out the data for the original industries and list of chemicals that existed in 1988, and also reports the last six

FIGURE 1. Blood Levels of Pentachlorophenol, Germany, 1985-2004



(Source: ESB)

FIGURE 2. Mercury Levels in Herring Gull Eggs, Germany, 1988-1996

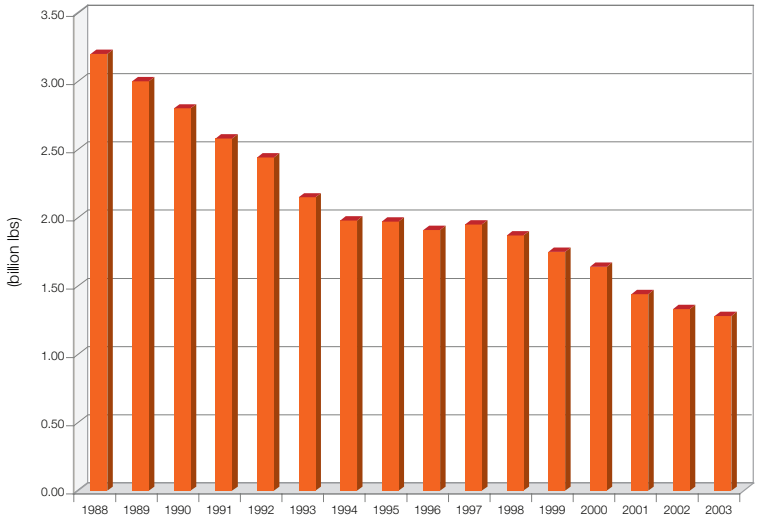


(Source: ESB)

years of data on a consistent baseline. Figure 3 shows the TRI trend according to the 1988 baseline—a decline of 60 percent. Most of this decline has occurred in the chemical industry, whose overall output of final product has increased during the period despite the reduction in its TRI profile.

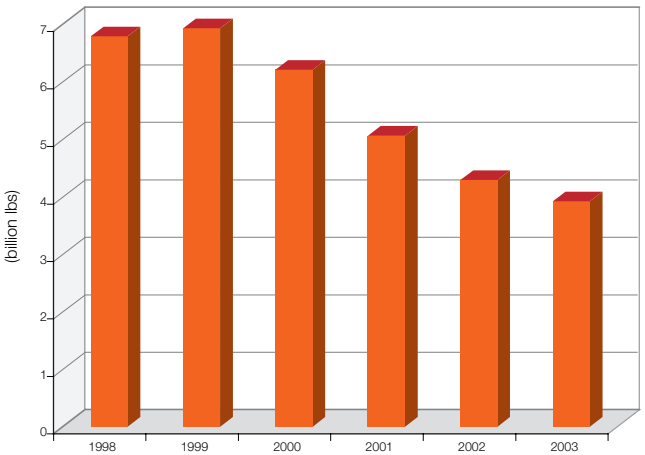
Figure 4 shows the trend for the last six years, which includes twice the number of chemicals and parties required to report (including finally federal facilities, which were exempt for many years)—a 42-percent decline. The latest TRI reports a decline in toxic releases in 2003 of slightly more than 300 million pounds, or about 2 percent. The EPA notes decreases in air emissions and surface water discharges, along with large increases in disposal of toxic chemicals in hazardous waste landfills, and increases in the amounts of toxic compounds recycled or treated on-site.

FIGURE 3. Toxics Release Inventory, 1988 Baseline



(Source: EPA)

FIGURE 4. Toxics Release Inventory, 1998-2003

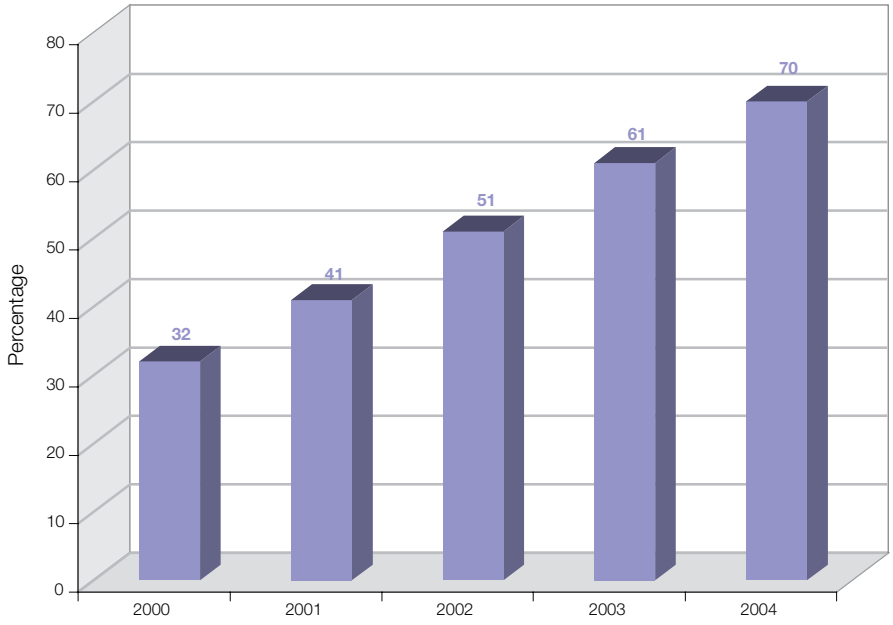


(Source: EPA)

SUPERFUND PROGRESS AT LAST

When the Superfund program was enacted in late 1980 in the aftermath of the overblown Love Canal scare, it was assumed that the federal government would move quickly to clean up contaminated sites around the nation. Instead, the program turned into a bureaucratic morass and litigation magnet. Over the last several years, however, rapid progress at cleanup has finally begun to occur. Of the 1,714 high-priority Superfund sites, the number where potential ground- or surface-water contamination is within EPA tolerances has increased from 32 percent in 2000 to 70 percent in 2004 (see Figure 5 below). (Note: There are about 6,000 total contaminated sites in the Superfund program.)

FIGURE 5. Percentage of the 1,714 High-Priority Superfund Sites With Migration of Contaminated Groundwater Under Control



(Source: EPA)

NOTES

[1] Peter Waldman, "Toxic Traces: New Questions About Old Chemicals—Levels of Risk: Common Industrial Chemicals In Tiny Doses Raise Health Issue—Advanced Tests Often Detect Subtle Biological Effects; Are Standards Too Lax?—Getting in Way of Hormones," *Wall Street Journal,* July 25, 2005.

[2] The three other stories in Waldman's series were: "New Questions About Old Chemicals—Fish Line—Mercury and Tuna: U.S. Advice Leaves Lots of Questions—Balancing Interests, Agencies Issue Guidance at Odds With EPA Risk Assessment," August 1, 2005; "New Questions About Old Chemicals—Under the Microscope: From an Ingredient In Cosmetics, Toys, A Safety Concern—Male Reproductive Development Is Issue With Phthalates, Used in Host of Products," October 4, 2005; "New Questions About Old Chemicals—Second Opinion: Study Tied Pollutant to Cancer; Then Consultants Got Hold of It—'Clarification' of Chinese Study Absolved Chromium-6; Did Author Really Write It?," December 23, 2005.

[3] December 13, 2005.

[4] See http://progressreport.cancer.gov/trends-glance.asp.

[5] Brenda K. Edwards, et al., "Annual Report to the Nation on the Status of Cancer, 1975 – 2002, Featuring Population-Based Trends in Cancer Treatment," *Journal of the National Cancer Institute,* Vol. 97, No. 19 (October 5, 2005).

[6] See: www.cdc.gov/exposurereport/3rd/default.htm.

[7] The TRI can be downloaded from the EPA website at www.epa.gov/tri/. Individual state facts sheets are also available on this site.

[8] 2003 TRI, p. 7.

[9] In addition, "toxic" chemicals are not all created equal, which is why a crude measure of mere "pounds" of toxics "released" is not an especially helpful measure of health of environmental risk. As the EPA notes,

> Some high-volume releases of less toxic chemicals may appear to be a more serious problem than lower-volume releases of more toxic chemicals, when just the opposite may be true. For example, phosgene is toxic in smaller quantities than methanol. A comparison between these two chemicals for setting hazard priorities or estimating potential health concerns, solely on the basis of volumes released, may be misleading.

In an effort to make possible better judgments about the relative risks of different kinds of toxics chemicals, the EPA is developing the Integrated Risk Information System (IRIS) on its website (see www.epa.gov/ncea/iris.htm). IRIS contains the results of ongoing toxicological screens of many of the chemicals on the TRI, along with links to other studies and EPA standards for exposure to the chemical. IRIS is not easy for the nonspecialist to use, but represents a major effort to adapt the massive reporting of the TRI into a useable product for local risk assessment. Another resource is EPA's chemical fact sheets, which are available at www.epa.gov/chemfact/.

[10] See: www.umweltprobenbank.de.

BIODIVERSITY

The lack of reliable metrics for the bundle of factors that comprise the issue of biodiversity makes it difficult to assess progress or regress. The UN Convention on Biological Diversity, which commits 188 nations to achieving a "significant reduction" in the loss of biodiversity by 2010, lacks any benchmarks, or even a framework, for judging progress. Right now, the most prominent proxy on the global level for threatened species is the World Conservation Union's "Red List" (see iucn.org). The Red List was not updated in 2005; as noted in the previous edition of the *Index*, the 2004 Red List reports 15,503 endangered species worldwide, up from 12,259 in 2003 (out of a database of about 1.5 million "described" species). The U.S. has 1,143 species on the Red List.

With frogs and other amphibians frequently in the news, it is worth taking note of the Global Amphibian Assessment (GAA; globalamphibians.org), an offshoot of the World Conservation Union's Red List. The GAA aims at a comprehensive assessment of 5,743 known species of frogs, toads, salamanders, and caecilians. The GAA lists 1,856 (32 percent) of amphibian species as endangered, and reports that 43 percent of all amphibian species are in decline. (By comparison, 12 percent of bird species and 23 percent of mammal species are considered threatened.)

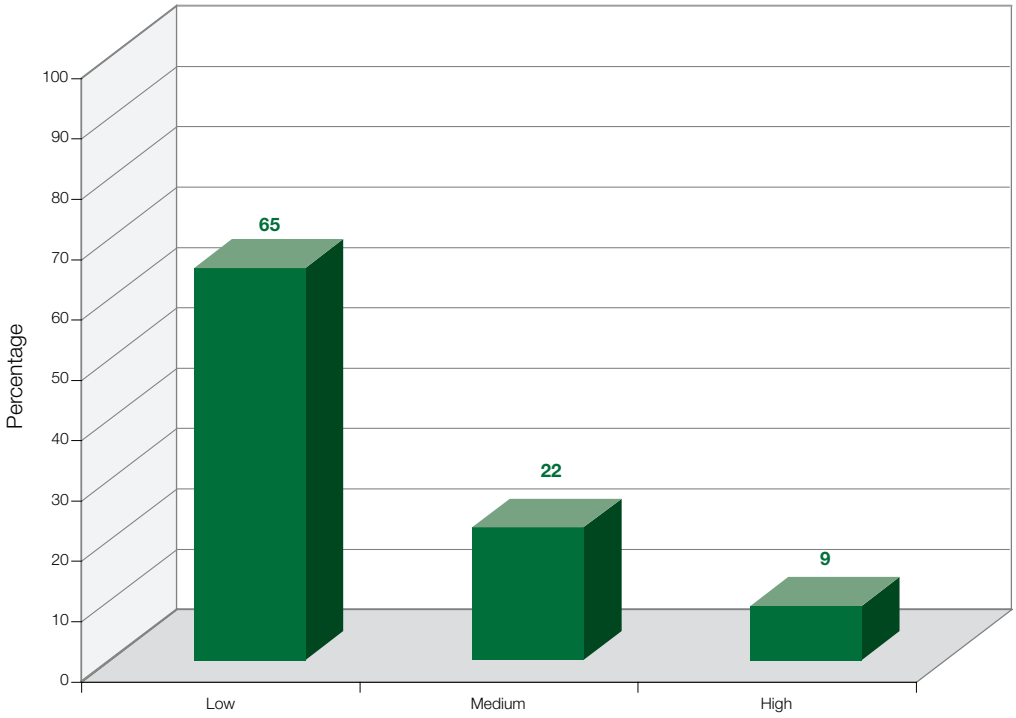
The most severe declining trends are found in Latin America. The GAA believes these figures may be an underestimate, because more than 20 percent of amphibian species are regarded as "data deficient," i.e., a lack of adequate data prevents judgment about the species' condition. The U.S. ranks ninth in terms of the number of different amphibious species found in its territory, with 263 identified species, of which 51 are considered threatened—one of the lower percentages among nations with 10 or more amphibious species. (The U.S. has the highest number of salamander species—168—in the western hemisphere.) Brazil has the largest number of amphibians, with 731 identified species; 110 are considered threatened. Haiti has the worst prospects: 92 percent of its amphibians are threatened. Habitat loss is the leading cause of amphibian decline, although fungal disease seems to be on the rise. (For more on amphibious species, see *Disappearing Jewels: The Status of New World Amphibians*, available at natureserve.org/publications/disappearingjewels.jsp.) Unfortunately the GAA does not yet provide year-on-year trend data.

One promising effort to devise a comprehensive measure of biodiversity and habitat integrity for the U.S. comes from the University of Florida's "Ecological Framework" (EF) project (conducted in conjunction with the EPA), which comprises five measures of ecosystem conditions for eight southeastern states[1] (see geoplan.ufl.edu/epa/download/sef_report.pdf). The virtue of the EF project is that it attempts to identify high-value land and assess general conditions and trends over a broad area, rather than concentrate on species-by-species issues in a highly localized way, as is the method of the Endangered Species Act. Three components of the Ecological Framework project deserve note: the "Hub and Corridor Connectivity Indicator," which charts the location and interconnections of critical ecosystems; the "Potential Land Use Change Indicator," which tracks the extent to which critical habitat is at risk of development or fragmentation; and the "Biodiversity Index," which ranks the level of species diversity on a 10-point scale.

The EF project identified between 30 and 35 percent of the total land area of the eight states as having "intact natural and semi-natural land cover that have a significant role in producing ecological services and harboring biological diversity." As is so often the case, limitations of unevenness of the data make it difficult to produce a reliable round number for the amount of land that can be classified as ecologically significant. The EF project chiefly concentrated on assessing contiguous land areas with a minimum of 5,000 acres. The Hub and Corridor Connectivity Indicator finds that nearly half (48 percent) of this land area enjoys some form of long-term protected status.

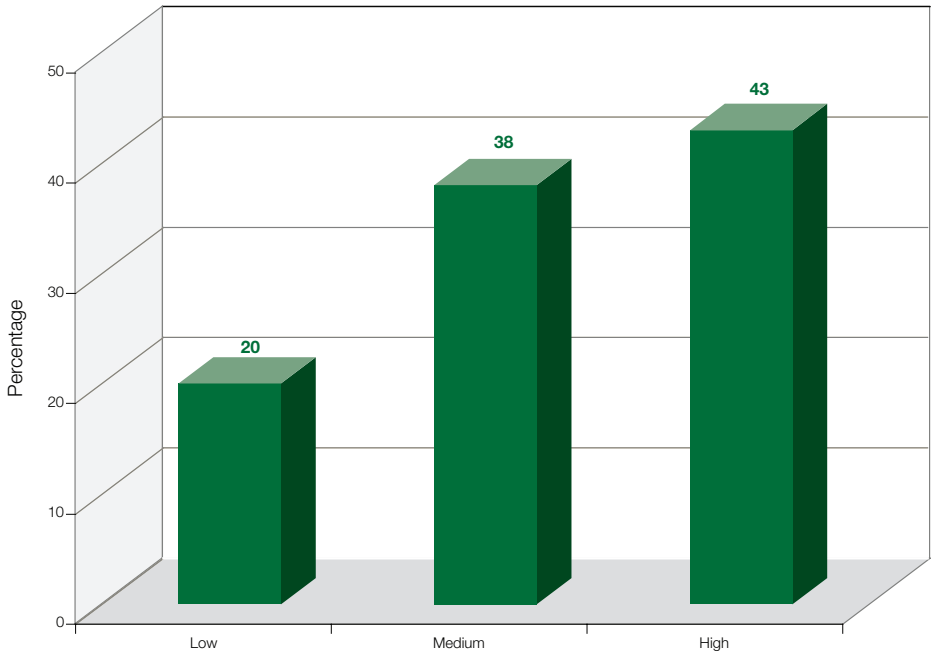
The Potential Land Use Change Indicator finds that 69 percent of this land area has low or no risk of fragmentation, with only 9 percent at high risk of fragmentation (see Figure 1). More than 80 percent of the land area scored medium (4-7) or high (8-10) on the Biodiversity Index (see Figure 2). Like other such efforts, further refinement in satellite-based Geographical Information System data analysis will provide increasingly detailed ability to judge ecosystem conditions and help set priorities for protection or remediation. The constant refinement of this kind of analysis, consisting mostly of analyzing smaller and smaller grids of land area, arguably slows the development of a consistent database from which to discern year-over-year trends. And obviously nothing like the EF project yet exists for the national level.

FIGURE 1. Potential Land Use Change in the Southeast



(Source: Southeastern Ecological Framework Project/EPA)

FIGURE 2. Biodiversity Index in the Southeast



(Source: Southeastern Ecological Framework Project/EPA)

BIODIVERSITY IN THE NEWS

With limited data, it is worth taking note of the interesting anecdotes and news stories that surfaced in 2005:

- The Catalogue of Life Program, begun in 2001 as a collaboration between Species 2000, a project based at the University of Reading in the U.K., and the Integrated Taxonomic Information System in Washington, D.C., has passed the half-million mark in the number of species listed in its database (see sp2000.org). A parallel project, the Census of Marine Life, has been identifying new marine species at a rate of about 150 a year. The Census of Marine Life is an ambitious 10-year project, involving more than 1,700 researchers in 73 countries, to inventory life in the world's oceans by 2010 (see coml.org or coreocean.org/dev2go.web?anchor=CoML_home_page).

- India has launched its most significant effort to date to conduct an accurate census of its tiger population, estimated to have declined by more than 90 percent in the last century to perhaps as few as 2,000. The chief cause of the tiger decline is aggressive poaching rather than habitat loss: various tiger parts can bring up to $50,000 on the black market. Meanwhile, to follow up on an aspect of this problem first reported in the 8th edition of the *Index*, demand for poached animal parts appears to be easing because of the greater availability and efficacy of Viagra. *Nature* magazine reported online in October: "VIAGRA HELPS OUT

ENDANGERED SPECIES; SWITCH TO WESTERN MEDICINE MAY SAVE CERTAIN ANIMALS FROM SLAUGHTER."

- While we're on the subject of tigers, researchers at the Australian Museum announced plans to attempt to revive the extinct Tasmanian Tiger through cloning. The last known Tasmanian Tiger died in captivity in 1936, but a viable DNA sample has been found.[2]

- Biologists in New Zealand discovered a substantial population of Canterbury knobbed weevils, thought to have gone extinct in 1922. The bugs' numbers seem ample enough to remove it from New Zealand's "critically endangered" list.[3]

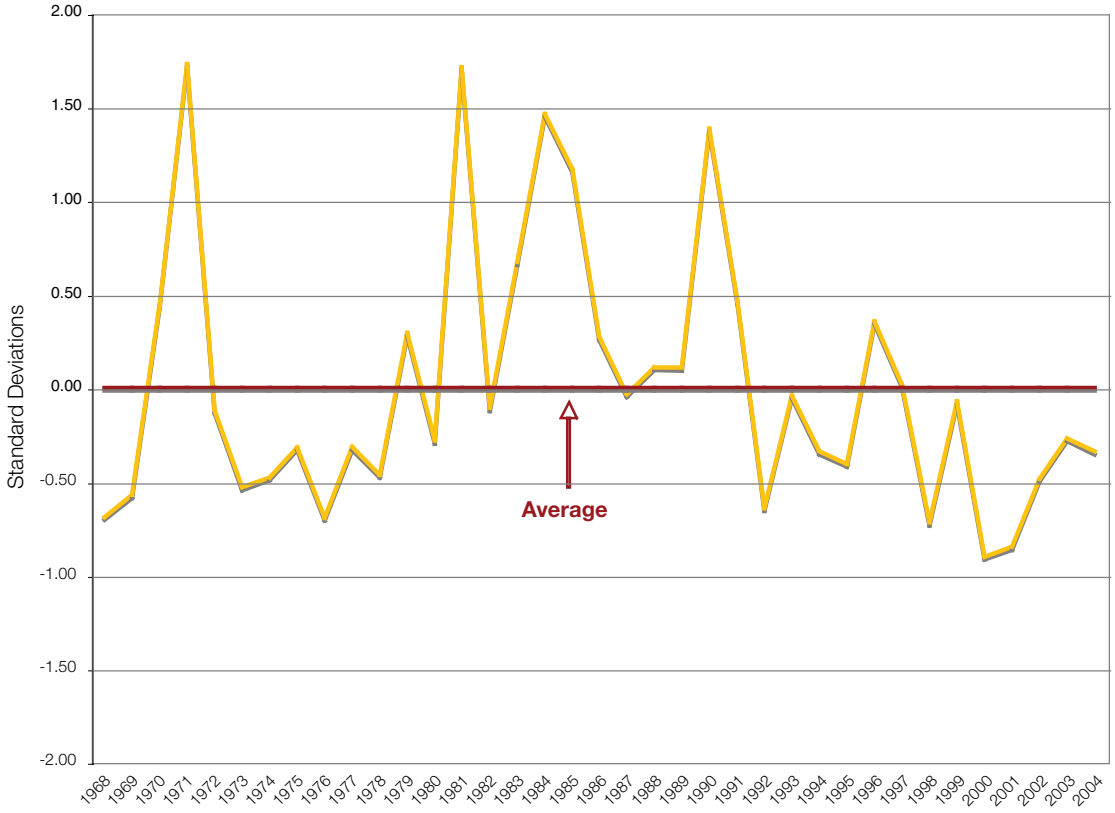
- Grizzly bears may be coming off the endangered species list. The largest population in the continental U.S. outside of Alaska lives in and near Yellowstone National Park, where the grizzly population has grown from about 200 in the early 1980s to about 600 today. The grizzly population is estimated to be growing between 4 and 7 percent a year.[4]

- By far the biggest back-from-extinction story of the year was the reappearance of the ivory-billed woodpecker, thought to have gone extinct in the 1940s. There were widespread doubts about the first ivory-billed sightings in 2004, but several independent observer teams confirmed the return of the bird to the Big Woods region of Arkansas. Meanwhile, in California, a plant thought extinct for more than 70 years was rediscovered near Mt. Diablo. The Mt. Diablo buckwheat is a pink wildflower that resembles the baby's breath used in floral arrangements. Botanists from the University of California at Berkeley are working on methods to stabilize and propagate the plant. Finally, the U.S. Department of Agriculture announced plans last spring to begin replanting a disease-resistant American chestnut tree in eastern forests. American chestnuts once thrived along the Atlantic seaboard, but were virtually wiped out by blight about 100 years ago.[5]

- *Science* magazine reported in October that new analysis of satellite imagery suggests that deforestation in the Amazon is occurring at twice the rate previously thought. New analysis captures the effects of selective (rather than clear-cut) logging that had been previously undetectable. The *Science* report placed the rate of deforestation at about 6,000 square miles a year.[6]

- The 2005 Chesapeake Bay Blue Crab Advisory, published in June, reports that the "spawning stock biomass" trended upward from 2001 to 2003, and remained flat in 2004. "This represents an improvement compared to the near historically low abundance levels occurring in 2000 and 2001," but "stock abundance levels remain relatively low, and, notably, survey results are not uniform." (The blue crab population measure is displayed in Figure 3 on the next page.) The commercial blue crab harvest in 2004, however, was up 25 percent from that in 2003.[7]

FIGURE 3. Chesapeake Bay Blue Crabs: Mature Females Spawning Stock Abundance



(Source: NOAA Chesapeake Bay Office)

NOTES

1 The eight states are: Florida, Georgia, Alabama, Mississippi, South Carolina, North Carolina, Tennessee, and Kentucky.
2 "Australian scientists plan to clone extinct Tasmanian tiger," *Agence France-Presse*, May 15, 2005.
3 Anne Beston, "'Extinct' bug found alive and well in high-country reserve," *New Zealand Herald*, May 5, 2005.
4 "Bearing Up," *The Economist*, November 5, 2005, p. 88.
5 Randolph E. Schmid, "Woodpecker Listed as Extinct Is Rediscovered," *Associated Press*, April 28, 2005; Justin M. Norton, "Wildflower Feared Extinct Discovered in California State Park," *Associated Press*, May 25, 2005; Sabina Haskell, Chestnut Group Visits White House," *Associated Press*, April 30, 2005.
6 Alok Jha, "Amazon rainforest vanishing at twice rate of previous estimates," *The Guardian*, October 21, 2005.
7 *2005 Chesapeake Bay Blue Crab Advisory Report*; noaa.chesapeakebay.net/docs/2005BlueCrabAdvRpt.pdf.

SPECIAL REPORT: *China as the Ultimate Test Case for Environmental Progress*

SUMMARY: *Recent environmental news out of China has lent new momentum to the gloomy view of China's environmental future amidst its headlong rush for economic growth. However, the gloom over China's environment may be overstated. China is an ideal test case of the controversial idea of the "environmental Kuznets curve," according to which economic growth precedes environmental improvement. The question for China is whether it can trace an abbreviated trajectory along the environmental Kuznets curve, and foreshorten some of the environmental damage that the U.S. and Europe experienced in the Industrial Revolution. Although current environmental trends in China are serious and deteriorating in many areas, some unappreciated signs of improvement are appearing.*

Nowhere is pessimism about the world's environmental prospects greater than in China. A series of media stories of spectacular environmental disasters reached a crescendo in late November when a chemical spill on the Songhua River in north-central China resulted in shutting off the water supply to Harbin—a city of 3.8 million people. The Songhua River spill was not the only such major incident recently. In March 2004, a chemical spill in the Tuojiang River resulted in a cutoff of water to more than a million people for 25 days. In June 2004, discharges from two paper plants and an inadequate government wastewater facility into the Yellow River, which supplies water to more than 10 percent of China's population, forced the Baotou City Water Company to stop intake from the river because of high pollution levels.[1] This episode led to what may have been the first-ever Western-style environmental lawsuit in China. In late December, the Baotou City Water Company was awarded $300,000 in damages from the paper companies and the wastewater treatment plant.

Environmental calamities may have become the principal source of political unrest and turbulence in China. In April the *New York Times* reported on a major riot in the southeastern province of Zhejiang where a crowd of up to 60,000, burned police cars, smashed windows, and injured more than 30 government workers in protest of pollution from nearby chemical plants.[2] The *Washington Post* followed up on the story in June, reporting that the violent protest, which apparently routed the Chinese government authorities in the region, was at least partially successful: six chemical facilities were shut down or relocated.[3]

Police in China Battle Villagers In Land Protest

Residents Say Girl Died and 60 Were Injured

By HOWARD W. FRENCH

SHANGHAI, Jan. 16 — A week of protests by villagers in China's southern industrial heartland over government land seizures exploded into violence over the weekend, as thousands of police officers brandishing automatic weapons and electric stun batons moved to suppress the demonstrations, residents of the village said Monday.

The residents of the village, Panlong, in Guangdong Province, said

This protest is reportedly just one of many occurring frequently in China in the last few years. In July, the *New York Times* reported another environmental protest in Xinchang, a city 180 miles south of Shanghai, where an estimated 15,000 people rioted for three days "in a pitched battle with authorities, overturning police cars and throwing stones for hours, undeterred by thick clouds of tear gas."[4] The object of their ire was a 10-year-old pharmaceutical plant, which the protestors wanted closed or relocated. News of environmental protests spread rapidly across the Internet, spawning imitators throughout the nation on a large—perhaps massive—scale. The *Times* reported that there are "government figures" showing 74,000 incidents of mass protest in China in 2004 (not all of them necessarily environmentally related). In early December, a protest against a proposed wind-power project turned deadly as Chinese security forces fired on a crowd, killing 10 people.[5]

The slow reflexes of the centralized Chinese government were on display in the aftermath of a massive benzene spill into the Songhua River by the Jilin Petrochemical Corporation. Although local officials were informed of the spill within hours of its occurrence, they withheld information from the public because they were awaiting instruction from senior Communist Party leaders in Beijing. When attempts to dilute the spill failed and tests showed benzene levels more than 100 times the safe level in Harbin's drinking water, officials told the public the water supply was being shut off "to carry out repair and inspections on the pipe network."[6]

The provincial governor was apparently still waiting for permission from Beijing to disclose the spill. More than a week passed before the Chinese government admitted the true story. And once the truth did come out, Beijing still tried to keep close control of information, telling reporters to stop asking questions and instructing news organizations to use reports only from the official New China News Agency. As in other instances of environmental catastrophe and subsequent popular protest, Chinese officials confiscated notes from Western reporters. But in the Internet age it is impossible to keep complete news from getting out. Several bloggers in Harbin posted photos and on-the-scene reporting of the difficulties in the water-deprived city.[7]

The Harbin episode and the related environmental protests open a window onto several tantalizing issues of environmental politics and policy. As the Chinese government is surely learning on all fronts, it is impossible to keep information and decisions centrally controlled. China had to issue a rare public apology to Russia, since the Songhua River flows into Russian territory. China also sacked the director of the State Environmental Protection Administration (SEPA) for negligence, in keeping with directives for greater accountability among government officials. More than 1,000 government officials were reportedly fired in the aftermath of the severe acute respiratory syndrome (SARS) epidemic in 2003.

CHINA'S "LITANY"

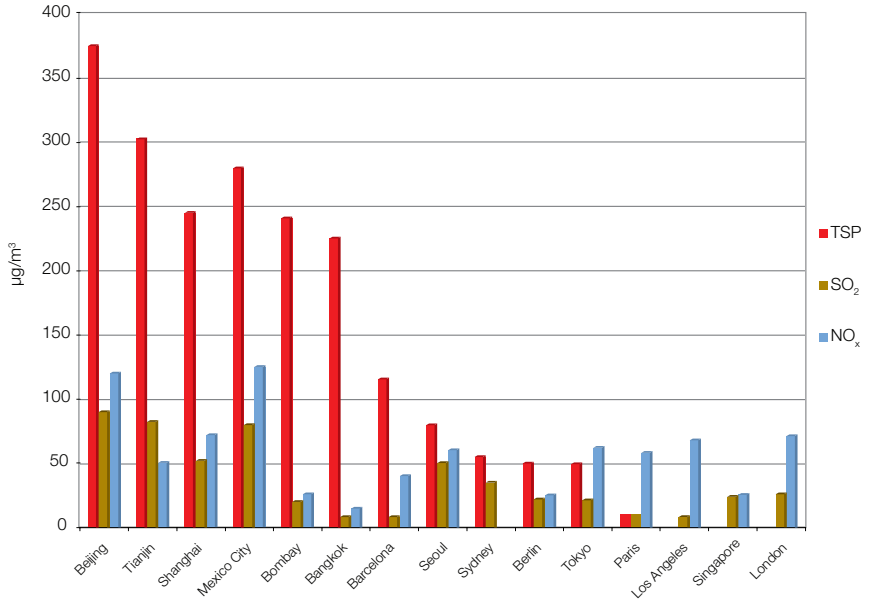
Beyond the political and administrative questions the Harbin episode raises is the issue of China's environmental performance and future course. The case of China might well be taken as a confirmation of what Bjørn Lomborg dismissed in *The Skeptical Environmentalist* as "the Litany"—an unrelenting picture of rising pollution and depleted resources leading ultimately to an ecological collapse. The conventional wisdom is that China's hyperspeed economic growth is exacting a frightful environmental cost that will get dramatically worse in the next few decades. Western environmentalists worry further that ecological catastrophe will spill beyond China's own borders and affect the entire globe. Bill McKibben expressed the conventional wisdom in the December issue of *Harper's:* "Deserts advance by hundreds of miles annually, and the dust storms of April and May are now a recognized Beijing season, just like spring and fall. Think Dust Bowl circa 1934—only in Pennsylvania and New Jersey, and with no vacant California left for the refugees. . . . I'm not sure China can escape the horrible environmental contradictions of its own growth."[8] "China's Boom Is Bust for the Environment" is an entirely typical *National Geographic News* online headline.[9]

"China's Next Big Boom Could Be the Foul Air," the *New York Times* reported in late October, just before the Songhua River spill.[10] The Worldwatch Institute website includes a feature called

ChinaWatch that tracks China's environmental gloom.[11] And the U.S. EPA has taken note of the prospect of air pollution originating in China wafting across the Pacific and affecting U.S. air quality. There have already been some extraordinary episodes of air pollution from Asia reaching North America.[12]

Nearly two-thirds of China's 343 major cities currently fail to meet the nation's air-quality standards, and air pollution is expected to get worse. The World Health Organization reckons that seven of the 10 most polluted cities in the world are in China (see Figure 1 for a comparison). These high levels of air pollution, according to the conventional health effect models, are responsible for thousands of premature deaths a year in China. In 2001 the World Bank estimated that economic losses from air pollution-related mortality and morbidity amounted to as much as 2 to 3 percent of GDP in India and China.[13] If this estimate is accurate, it suggests that pollution abatement offers meaningful economic returns.

FIGURE 1. Air Quality Comparison of Some World Cities, Year 2000 (Average Annual Levels, Particulates [TSPs], SO_2, and NO_x)



(Source: Hao & Wang, J. Air & Waste Manage. Assoc., *Vol. 55 [2005], p. 1300)*

The International Energy Agency forecasts that China's greenhouse gas emissions will rise nearly 120 percent in the next 20 years, by which time China's emissions will exceed those of the U.S.

Although China receives the most attention, it is not the only Asian nation where this concern is present. India is also growing rapidly, and its major cities experience particulate levels often eight to 10 times higher than the worst American cities. India's greenhouse gas emissions are forecast to grow 70 percent by 2025. Already, according to a recent report from British Petroleum (BP), China and India have passed the U.S., Europe, and the former Soviet Union in coal consumption.[14]

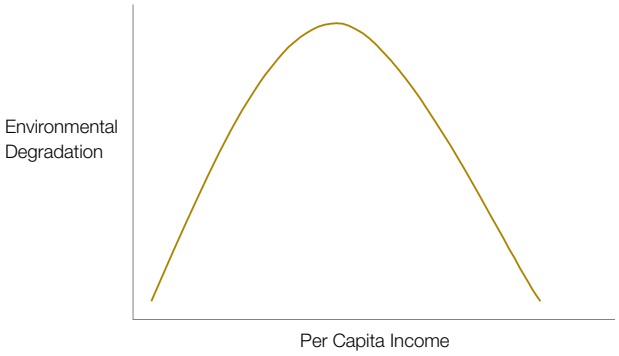
Beyond air pollution and greenhouse gas emissions, China is also experiencing high levels of water and ocean pollution, soil erosion, and heavy stresses on forest, wetlands, and endangered species. The scarcity of potable water is nearing crisis proportions. Groundwater has been badly depleted, and surface water sources are equally overused. The Yellow River, for example, has run dry every year since 1985 because of diversions; in 1997, it failed to reach the ocean for 226 days. China's State Environmental Protection Administration reported in June that 25 of the 27 largest lakes in China were polluted, some seriously.[15] Chinese industry appears to be sloppy in its practices. China's SEPA reported as many as 2,500 environmental "accidents" a year in the last decade.[16]

DISMAL FUTURE OR TURNING POINT?

As dismal as this picture is, the conventional wisdom about China's environmental future is likely to be wrong. A closer look at facts on the ground and recent trends suggests that China is an excellent test case for the controversial theme known as the "Environmental Kuznets Curve" (EKC). The EKC holds that the relationship between economic growth and environmental quality is an inverted U-shape, according to which environmental conditions deteriorate during early stages of economic growth, but begin to improve after a certain threshold of wealth is achieved (see Figure 2).

The original Kuznets Curve was named for Nobel laureate Simon Kuznets, who postulated in the 1950s that income inequality first increases and then declines with economic growth. In 1991, economists Gene M. Grossman and Alan B. Krueger suggested the Kuznets Curve applied to the environment.[17] It was a powerful counterargument to the once-conventional view, popular in the aftermath of the Limits to Growth enthusiasm of the 1970s, that economic growth was the enemy of the environment, and the EKC gained wide acceptance as a key development concept in the 1990s, including at the World Bank.[18]

FIGURE 2. Stylized Environmental Kuznets Curve



There is a burgeoning economic literature about the EKC, with the usual controversy over econometric methodology and robustness of the model. Most of the empirical and econometric research on the EKC examines air and water pollution, as air and water pollution offer the best datasets for cross-national analysis. Critics argue that the EKC is not statistically robust, that it does not apply to the full range of environmental impacts, and that it does not account for displacement effects, i.e., the "race to the bottom," whereby richer nations outsource their environmentally harmful production functions to poorer nations with lower environmental controls, resulting in net increases in global pollution.[19]

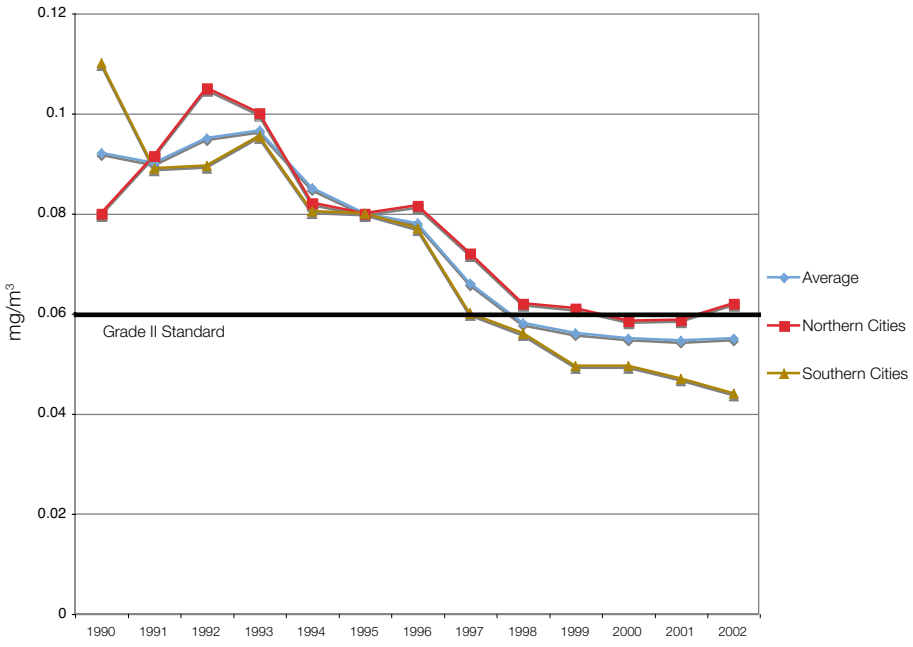
Defenders of the EKC argue optimistically that the EKC is actually dropping and shifting to the left, meaning that the developing world will reach the environmental turning point sooner than today's wealthy nations did. Developing nations, it is thought, will skip over some of the stages of growth and pollution by adopting cleaner technologies earlier in their development path and developing regulatory institutions to control pollution.

Although further empirical research will no doubt advance our understanding of the strengths and weaknesses of the EKC, China has emerged as a real-world test case. Several EKC studies conclude that sulfur dioxide (SO_2) pollution begins to decline at a per-capita income level in the range of $5,000 to $9,000, and particulates begin to decline at a per-capita income range from $5,000 to $15,000. China is still far away from this range, with a current per-capita income of about $3,000. However, by some measures China's SO_2, ozone, and particulate levels may have already peaked and begun declining, offering preliminary evidence that the EKC is dropping and shifting to the left.

Jiming Hao and Litao Wang, researchers at Tsinghua University in Beijing, recently published data in the *Journal of the Air and Waste Management Association* showing declines in the level of ambient air pollution in China from 1990 to 2002, as shown in Figures 3-6.[20] (The higher levels of air pollution in northern Chinese cities in Figures 3-5 are due mostly to the fact that these areas burn much more coal during the winter. Unlike most U.S. cities, air quality is worst in Beijing during the winter months.) During this period the number of motor vehicles in China nearly quadrupled, while total energy consumption increased by one-third. Yet as Hao and Wang observe, "the air pollution emissions did not increase as quickly as economic growth and energy consumption, and air quality in Chinese cities has improved to some extent."

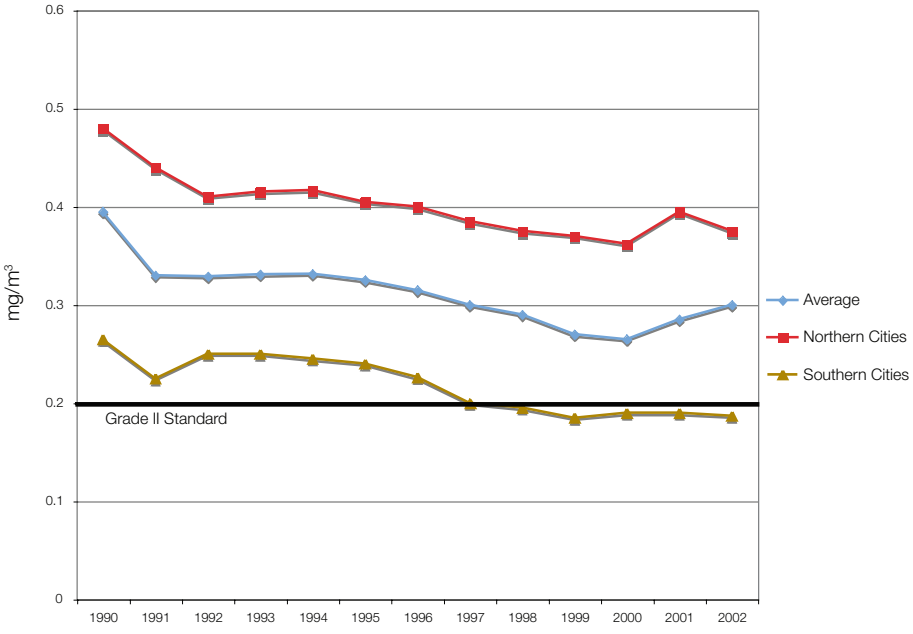
China's SEPA reports some progress in improving the number of cities that achieve their Grade II ambient air-quality standards (which are comparable to U.S. ambient standards), as the figures show northern Chinese cities especially have a long way to go to meet the standard. As Figure 6 shows, Beijing has made substantial improvement in SO_2 levels, but still does not meet China's Grade II standard. (Grade II represents the Chinese air-quality standards for urban areas. China's Grade I standards for rural areas are 30 to 60 percent tougher, depending on the pollutant.)

FIGURE 3. Average Annual Ambient SO_2 Levels in Chinese Cities



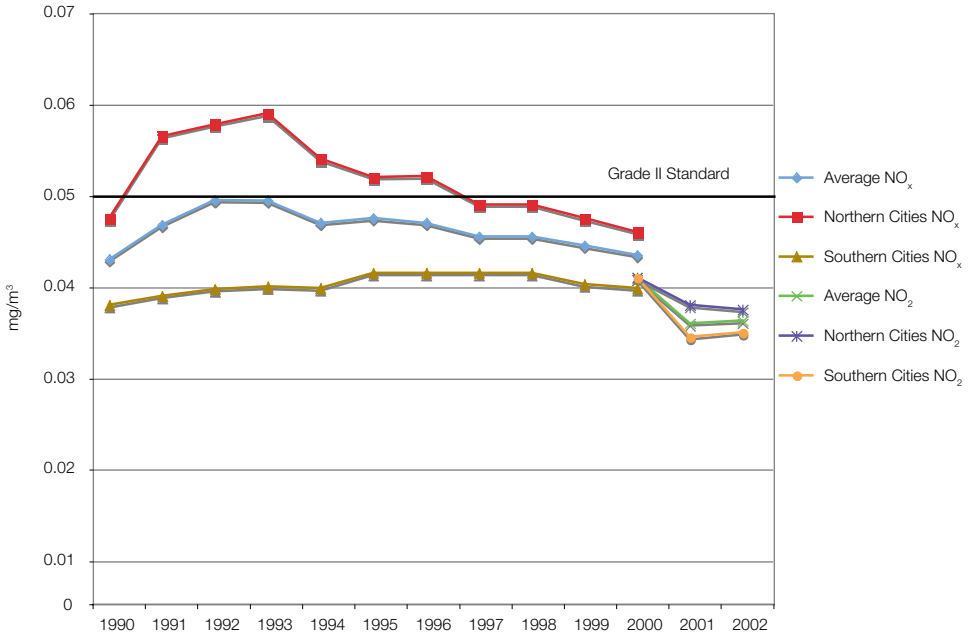
(Source: Hao and Wang)

FIGURE 4. Average Annual Ambient Total Suspended Particulate (TSP) Concentrations



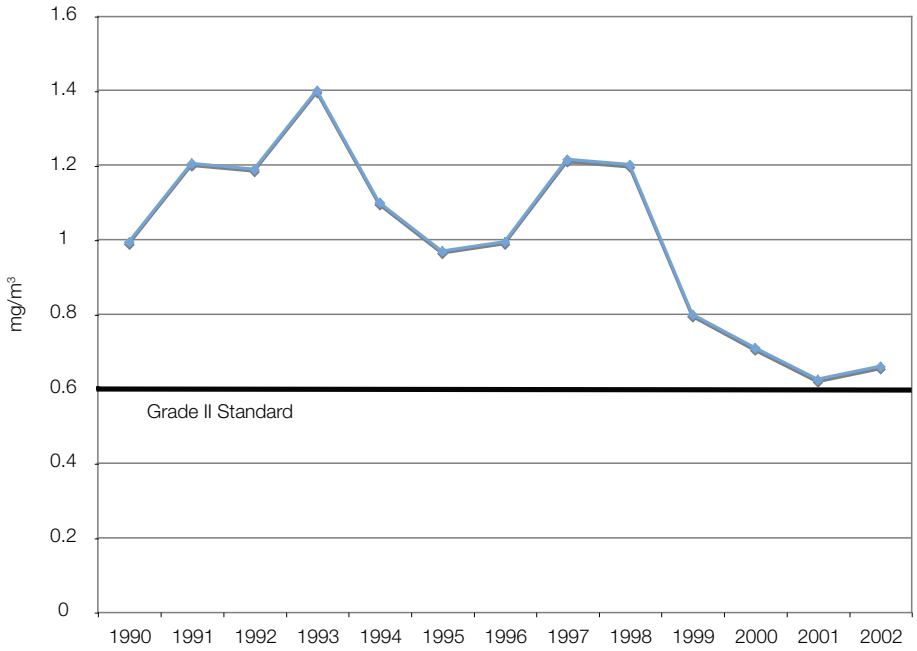
(Source: Hao and Wang)

FIGURE 5. Average Annual Ambient NO_x Levels in Chinese Cities



(Source: Hao and Wang. Note: In 2000, China began reporting NO_2 instead of NO_x.)

FIGURE 6. Average Annual Ambient SO_2 Levels in Beijing



(Source: Hao and Wang.)

As has been the experience of the U.S. and Europe, fossil-fuel energy consumption can go up while pollution falls if emission-control technology is adopted. This is starting to occur in China at a faster rate than Westerners recognize. China has adopted ambient air-quality goals that are, in some cases, nominally more ambitious than U.S. Clean Air Act ambient standards (see Table 1). China is starting to implement the kind of stationary and mobile source control measures that have been common in the U.S. and Europe for a generation, and China has adopted the EU's tailpipe emissions standards for its growing auto fleet, which are comparable to the U.S. Tier II tailpipe standards. Among other indicators of progress, Beijing now has the largest fleet of natural gas buses in the world.

China has also started lifting restrictions on small automobiles (those with engines of less than 1.0 to 1.3 liters) in a bid to reduce oil consumption. This may have mixed results in the short run, as these smaller engines often have no emission controls, one reason their use had been restricted. Newer engine models with better performance are coming online, however. Although China is building numerous new coal-fired power plants, it has set a goal of generating 10 percent of its electricity by 2020 through renewable sources such as wind power, and windmills are proliferating across the landscape.

TABLE 1. Chinese and U.S. Ambient Air-Quality Standards

	China Grade II, μg/m³	U.S., μg/m³
SO_2—Annual	0.06	0.08
SO_2—Daily	0.15	0.365
SO_2—Hourly*	0.5	0.655
PM_{10}—Annual	0.1	0.05
PM_{10}—Daily	0.15	0.15
NO_x—Annual	0.08	0.053
NO_x—Hourly	0.04	0.047
CO—Daily†	4	10
CO—Hourly†	10	40
O_3—Hourly	0.16	0.2

*California only.
†mg/m³.

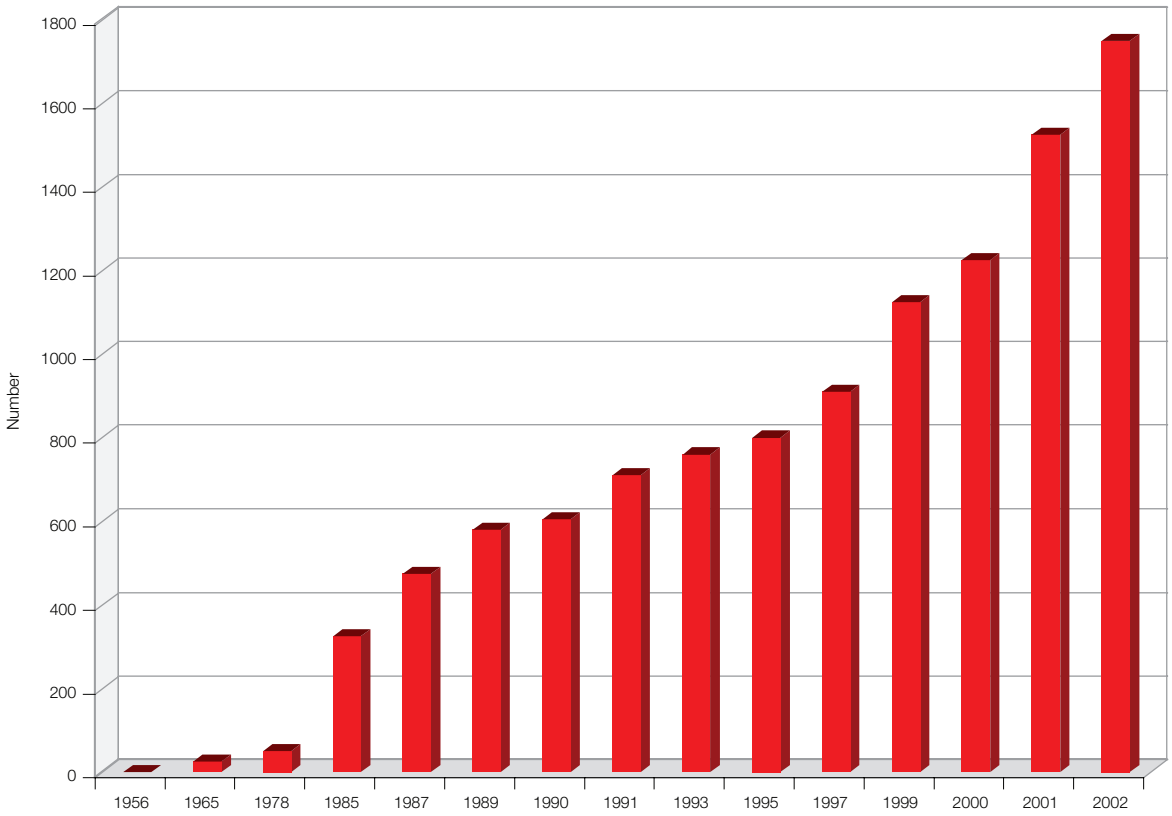
(Source: EPA/SEPA)

China has been enacting environmental laws that resemble the landmark legislation the U.S. and Europe enacted in the 1970s, and SEPA reports that spending for environmental projects is increasing about 15 percent a year. China even has its own version of the American NEPA (National Environmental Protection Act), requiring construction projects to perform an environmental impact assessment (EIA) as a part of the planning and building permit process. In 2004 more than 320,000 construction projects went through the EIA review process.

To be sure, China's environmental reviews may not meet the exacting standards of either the U.S. EPA or the Sierra Club, and even if the optimists are right that the EKC for China is dropping and shifting to the left, it still means that some of the environmental news out of China is going to get worse before its gets better. The central point remains that although China has a long way to go, China's environmental news may start improving a lot sooner and faster than people expect. Already there are signs the corner has been turned on areas aside from air pollution.

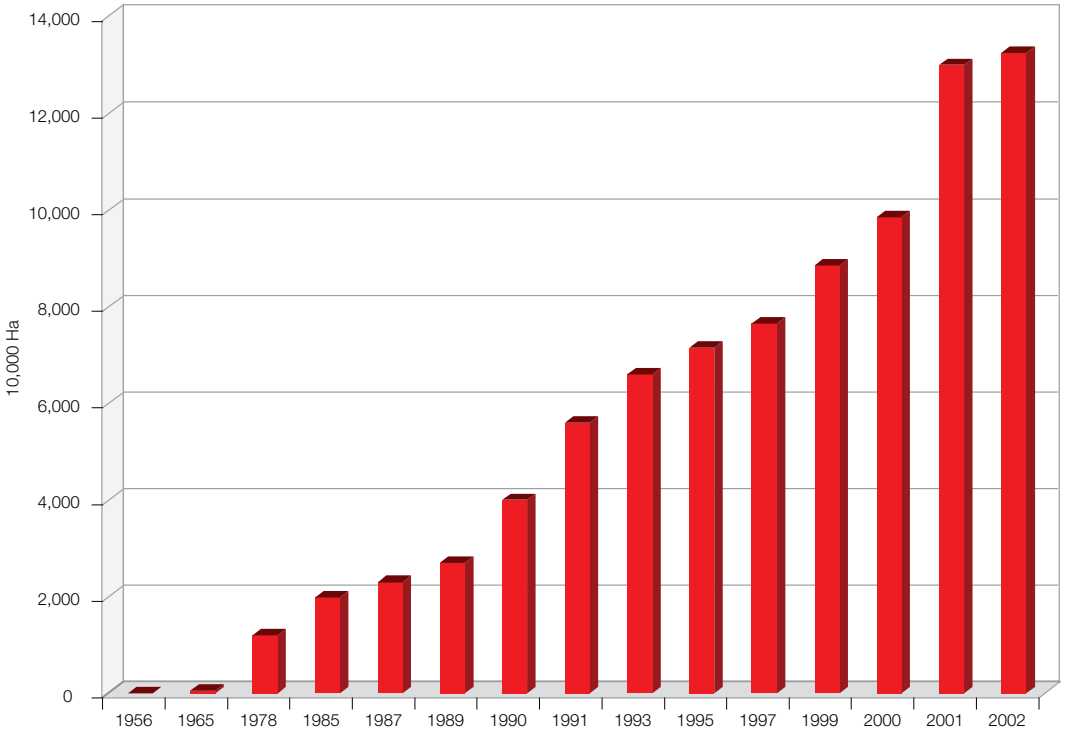
Industrial discharge of petroleum-related pollutants and some heavy metals into rivers and oceans has been cut in half over the last decade.[21] Wastewater treatment facilities are being built at breakneck speed; between 2000 and 2005, total wastewater capacity should have doubled. China's reforestation program appears to be taking flight; SEPA reported that 4.8 million hectares of forestland were planted in 2004, and that forestland has been growing at slightly more than 1 percent a year in the last decade.[22] And, as Figures 7 and 8 show, China is dedicating more land for nature preserves.

FIGURE 7. Nature Reserves in China



(Source: SEPA, sepa.gov.cn/english/SOE/analysis/)

FIGURE 8. Total Land Area of Chinese Nature Reserves



(Source: SEPA, sepa.gov.cn/english/SOE/analysis/)

INSTITUTIONAL AND POLITICAL REFORM?

To be sure, there is a *dirigiste* flavor to Chinese environmental policy, with lots of five-year plans for various environmental problems that sound like you-know-what. (Bill McKibben reported seeing large billboards that read: "Carefully operate the policy of the central government on forest management," and "Keep the sand here and the water clean to make our area wealthy and serve Beijing!")[23] But there are also examples of Chinese awareness that markets may be more effective than regulation for problems such as water scarcity. One of the key controversies in the EKC literature is the role of institutions and public demand for environmental improvement. These exogenous factors—or political factors, as noneconomists would say—are perhaps a more important variable in environmental performance than mere income levels.

This brings us back to the beginning, to the Songhua River spill and the mounting environmental protests occurring in China. Is it possible that the environment might be the catalyst for political reform in China? The Songhua River spill might be likened to the Cuyahoga River fire of 1969, which was one of the galvanizing events in the rise of the modern environmental movement in the U.S.. In a nutshell, the public outcry over the Cuyahoga River (which had experienced fires several times before with little public fanfare) showed that the affluent society no longer wished to be the effluent society. Certainly rising middle-class consciousness is involved with the popular protests about environmental calamity in China.

Perhaps the better comparison is with the 1986 Chernobyl nuclear accident in the Soviet Union, which helped galvanize political liberalization under Mikhail Gorbachev. As has been demonstrated in numerous transnational studies, there is a strong correlation between various indices of political freedom and environmental performance.[24] If China responds to its environmental challenges with administrative decentralization and greater use of market mechanisms and property rights, who knows where it might lead.

MEXICO'S CLEAN-UP

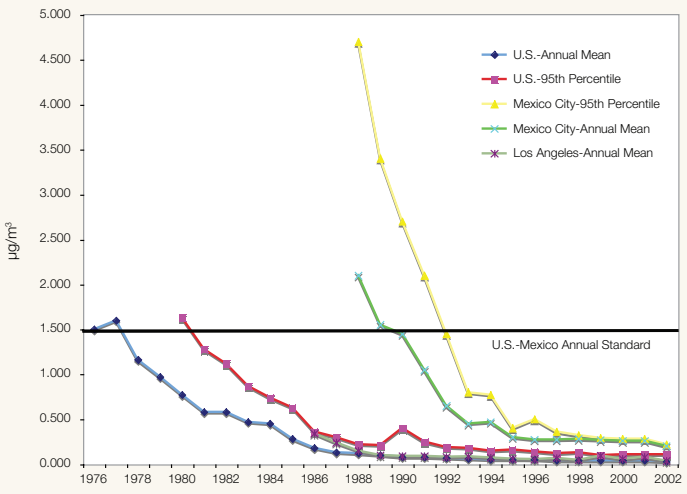
When considering the prospects for China's environment, it may be helpful to look at the case of Mexico, whose capital, Mexico City, is the third-largest in the world and has long had one of the world's worst air-pollution problems on account of its geography (a high altitude that accentuates atmospheric inversion layers) and low-tech industry. Though Mexico's economic growth has not been as robust as China's, it is possible to observe the environmental benefits of growth occurring below our southern border.

Mexico has adopted air-quality standards that are the same as or close to the U.S. standards for the six "criteria" pollutants regulated under the U.S. Clean Air Act.[25] The comparisons below match up Mexico City with Los Angeles, which generally has the highest air pollution levels among U.S. cities.[26] While Mexico City's air pollution is still far more severe than the worst locations in the United States, Mexico City now attains the air-quality standards for four of the six criteria pollutants regulated (lead, sulfur dioxide, carbon monoxide, and nitrogen oxides). Like the U.S., Mexico City's remaining problems are with ozone and particulates. Mexico City still violates the 1-hour ozone standard more than 250 days per year; Los Angeles has exceeded the 1-hour ozone standard less than 30 days per year in 2004 and 2005, down from 195 days in 1977.

Figures 1 and 2 show how Mexico City has followed the path of the U.S. in reducing airborne lead, chiefly through the introduction of unleaded gasoline and carbon monoxide. (Note: A caveat about the comparison in Figure 2 should be kept in mind. For carbon monoxide, Mexico reports peak levels at the 95th percentile, while the EPA reports peak levels at the second-highest daily maximum. Although these metrics are similar, they are not identical. Under either measure, both Los Angeles and Mexico City meet their respective air quality standards for carbon monoxide.)

Figure 3 displays trends in sulfur dioxide levels for Mexico City, Los Angeles, and Pittsburgh (the U.S. city with the highest sulfur dioxide levels). The studies consulted for this report did not explain the abrupt sharp decline in sulfur dioxide levels in Mexico City starting in 1993. Most likely a combination of fuel switching and the introduction of emissions control technology accounts for the change, though a change in monitoring might have occurred.

FIGURE 1. Ambient Lead in the U.S. and Mexico



(Source: EPA, Molina & Molina)

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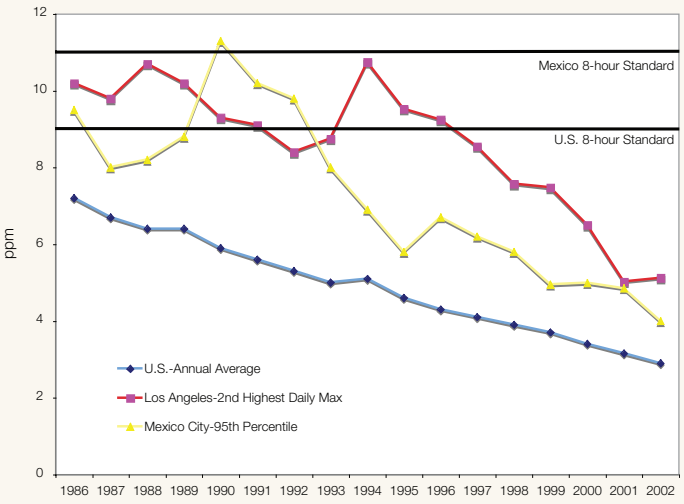
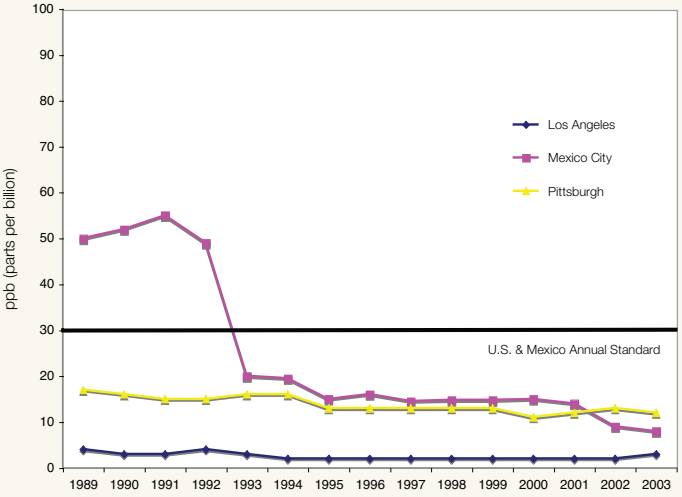
MEXICO'S CLEAN-UP, FROM PAGE 87

FIGURE 2. Ambient Carbon Monoxide in the U.S. and Mexico



(Source: EPA, Molina & Molina)

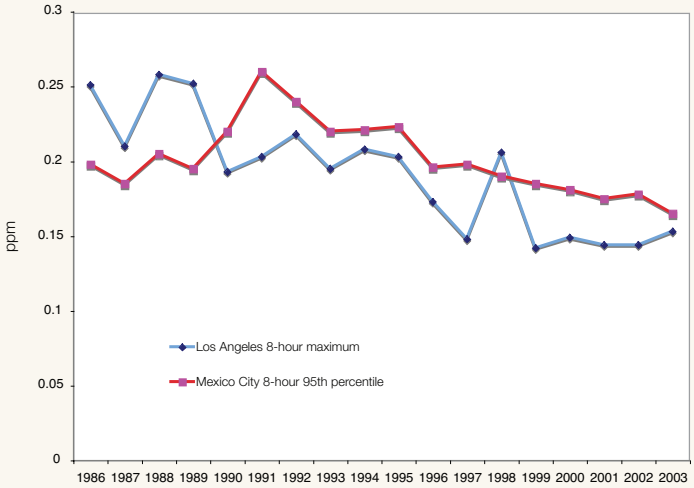
FIGURE 3. Ambient Sulfur Dioxide for Mexico City, Los Angeles, and Pittsburgh



(Source: EPA, Molina & Molina)

Figure 4 compares 8-hour maximum ozone levels in Los Angeles with 8-hour 95th percentile levels in Mexico City. These metrics are not identical, so this comparison should be used only to illustrate relative trends and not an exact head-to-head comparison. (It is unlikely that Los Angeles actually had higher peak levels ozone from 1986 to 1989.) From its worst reading in 1991, peak ozone levels in Mexico City have fallen by more than one-third.

FIGURE 4. Peak Ozone Levels in Los Angeles and Mexico City



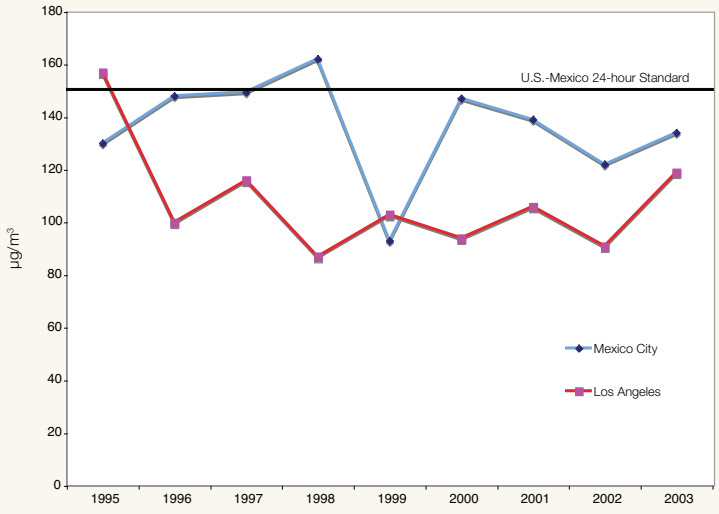
(Source: EPA, Molina & Molina)

Figure 5 on the next page displays trends in particulate levels for Mexico City and Los Angeles. Mexico City has only been monitoring 24-hour PM_{10} peak levels since 1995, so the comparison is limited.

Finally, Table 1 on the next page below shows the percentage declines in ambient air pollution for Los Angeles and Mexico City from the late 1980s through

2003. Keep in mind that Los Angeles has been after the problem much longer than Mexico, such that head-to-head percentage comparisons can be misleading. This table is offered more as an illustration that the magnitude of air-quality improvement in Mexico City is substantial.

FIGURE 5. 24-hour PM_{10} Levels in Los Angeles and Mexico City



(Source: EPA, Molina & Molina)

PROSPECTS FOR FURTHER IMPROVEMENT

Mexico City can look forward to further substantial declines in ozone in the decade ahead, simply through turnover of its auto fleet. As of 2002, almost a third of Mexico City's auto fleet consisted of pre-1980 model cars; only about 10 percent of the auto fleet had up-to-date electronic ignition and fuel injection systems that are standard on all American autos today, and barely 30 percent had catalytic converters. As these older cars, which emit as much as 10 to 20 times more pollution as new models, are retired and replaced, there will be rapid progress in reducing ozone.

TABLE 1. Ambient Air Pollution Trends, Los Angeles and Mexico City, 1986-2003

	Los Angeles	Mexico City
Lead (Annual avg.)	–76%	–90.5%
Ozone	–39%	–16.7%*
Sulfur Dioxide	–29.4%†	–84%
Carbon Monoxide	–57.9%	–49.8%

*If measured from the peak year of 1991, Mexico City's ozone level has declined 36.5%.
†Comparison with Pittsburgh instead of Los Angeles.

NOTES

[1] "Chinese Firms Pay in Pollution Deal," *Washington Post*, January 5, 2006, p. D-6.
[2] Jim Yardley, "Thousands of Chinese Villagers Protest Factory Pollution," *New York Times*, April 13, 2005.
[3] Edward Cody, "For Chinese, Peasant Revolt Is Rare Victory; Farmers Beat Back Police in Battle Over Pollution," *Washington Post*, June 13, 2005, p. A-1.
[4] Howard W. French, "Anger in China Rises Over Threat to Environment," *New York Times*, July 19, 2005.
[5] Edward Cody. "Chinese Police Kill Villagers During Two-Day Land Protest," *Washington Post*, December 9, 2005, p. A-1. Once again, bloggers offered arguably superior news coverage, along with photos. See http://gatewaypundit.blogspot.com/2005/12/china-opens-fire-kills-20-protesters.html.
[6] Ibid.
[7] See http://bmcgonigle.blogspot.com/2005/11/water-lieu-resolution.html.
[8] Bill McKibben, "Letter from China," *Harper's*, December 2005.
[9] http://news.nationalgeographic.com/news/2005/05/0516_050516_chinaeco.html.
[10] Jim Yardley, "China's Next Big Boom Could Be the Foul Air," *New York Times*, October 30, 2005.
[11] See http://www.worldwatch.org/features/chinawatch/.
[12] See Jim Szykman, David Mintz, Jack Creilson, and Michelle Wayland, "Impact of the Asian 2001 Dust Event on Particulate Matter Concentrations in the United States," U.S. EPA *National Air Quality and Emissions Trends Report, 2003*, Special Studies pp. S-1 - S-12, available at http://www.epa.gov/airtrends/aqtrnd03/pdfs/1_asiandust.pdf.
[13] Bolt, K., K. Hamilton, K. Pandey and D. Wheeler, "The Cost of Air Pollution in Developing Countries: New Estimates for Urban Areas," *World Bank Development Research Group* Working Paper, forthcoming.
[14] www.bp.com/statisticalreview.
[15] "Environmental problems 'unchanged'," *Xinhua*, June 2, 2005.
[16] French, op cit.
[17] Gene M. Grossman and Alan B. Krueger, *Environmental Impact of a North American Free Trade Agreement*, Working Paper 3914, National Bureau of Economic Research. A revised and expanded version of their paper, entitled "Economic Growth and the Environment," was published in the *Quarterly Journal of Economics*, Vol. 110, No. 2 (May 1995), pp. 353-377.
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